Volume XXXV.
Number 2.

MAY, 1908.

$2.00 per year.
$3.00 with Directory.

1868 # TEXTILE WORLD RECORD 1908

Special Features

The Meeting of the National Association of Cotton Manufacturers.

The Exhibition and Program of the Hosiery and Knit Goods Manufacturers Convention in Philadelphia.

Estimating the Cost of Woolen Goods.

International Patents.

The New Lawrence Textile School.

LORD & NAGLE COMPANY · BOSTON, MASS.

JOHN JEPSON, BOSTON.

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Table of Contents, Page 65. Buyers Index, Page 201. Index to Advertisements, Page 211

The Textile-Finishing Machinery Co.

HOWARD BUILDING

STAIRWAYS, 83 EXCHANGE PLACE [ENTRANCES] ELEVATOR, 171 WESTMINSTER ST.

PROVIDENCE, R. I.

BUILDERS OF ALL KINDS OF

MACHINERY

FOR

BLEACHING
DYEING
DRYING

AND

FINISHING

Singeing Machines,

Boiling Kiers,

Washers, Squeezers,

Chemic and Sour

Rusden Patent

Continuous Chainless

Steamer,

Aniline Agers,

Dyeing Machines,

Open Soapers,

Blanket Washers,

Color Kettles,

Horizontal or Vertical Drying Machines, with Copper or Tinned Iron Cylinders,

Automatic Tentering Machines,

Water and Starch Mangles,

Dampening Machines,

Dyeing Machines for Chain Warps.

Calenders for Rolling, Glazing, Chasing and Embossing, also Calenders for Moire Finish.

Sole Manufacturers of Patented Flexible Cloth Expander for Cylinder Drying Machines, Calenders, Mangles, &c.

Patent Combination Rolls Made of Cotton and Husk, especially adapted for Soft Finish, Unequalled for Elasticity and Durability.

Cotton, Paper, Husk, Chilled Iron, Brass and Rubber Rolls, Electro-deposited Copper Rolls for all Purposes.

Padding and Drying Machines for Shade Cloths.

Single and Double Cylinder Engines.

Hydraulic Presses and Pumps.

Mercerizing Machinery for Piece Goods and Yarn in the Warp or Chain

ALL KINDS OF OUTFITS FOR BLEACHING THREAD AND SOFT TWISTED YARN.
BLEACHING MACHINERY FOR YARNS IN THE WARP OR CHAIN.

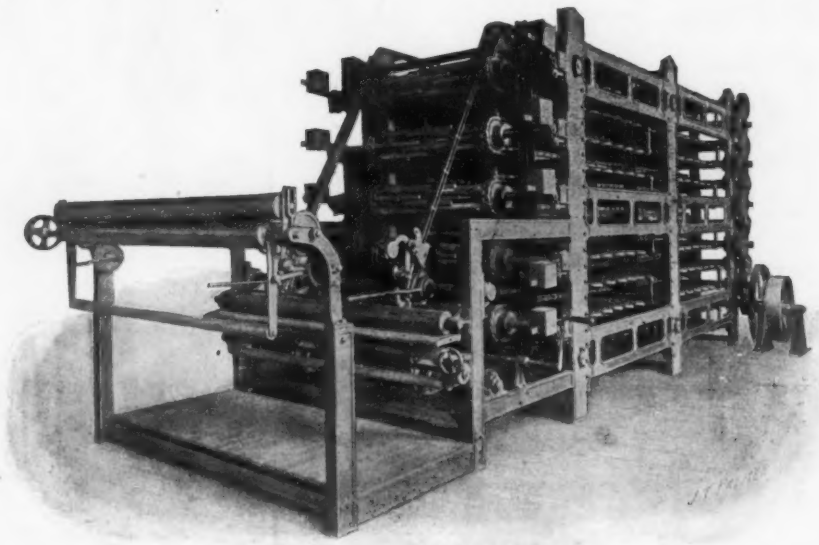
Estimates, Drawings and full particulars of complete plants furnished on application

Southern Agent, STUART W. CRAMER, Charlotte, N. C., Equitable Building, Atlanta, Ga.

H. W. BUTTERWORTH & SONS CO.

PHILADELPHIA, PA

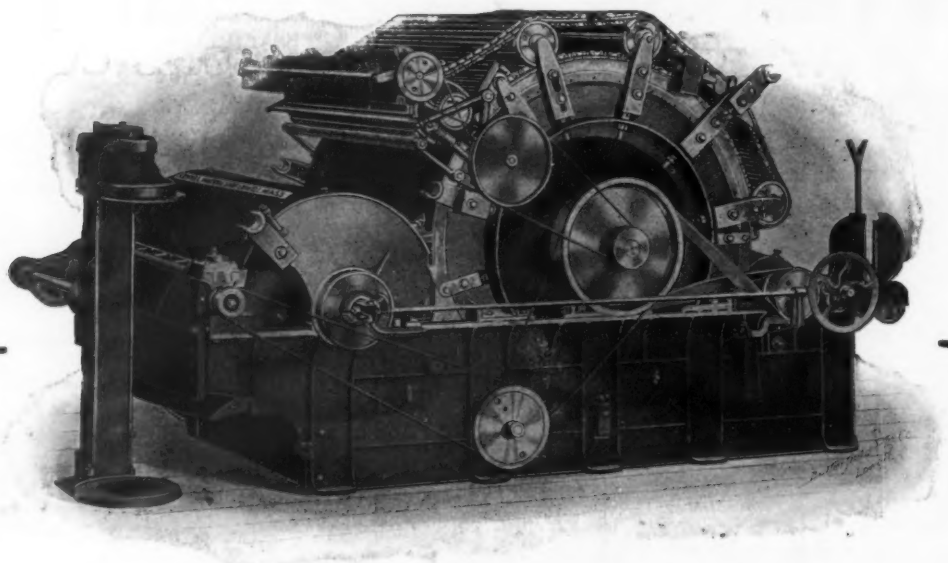
Providence, Room 417, Industrial Trust Building.



Return Tentering Machine—Low-down Platform, for Woolen and Worsted Goods.

Bleaching, Dyeing Drying and Finishing Machinery

for all kinds of textile fabrics.



Cotton and Worsted Machinery

With Modifications to Suit Any Class of Work.

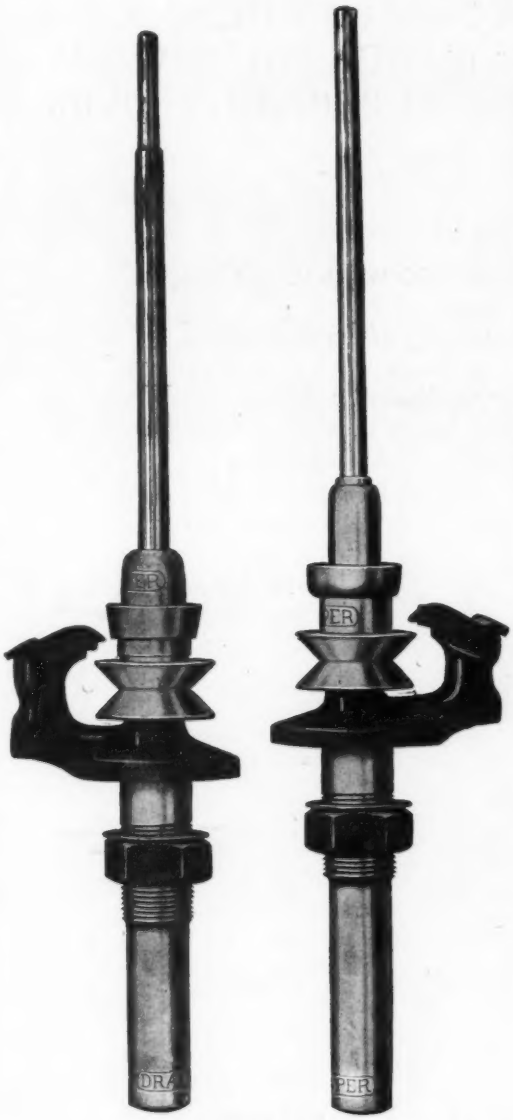
Cotton Machinery: Cards, Railway Heads, Drawing Frames, Fly Frames, Speeders, Ring Spinning Frames, Twisters, Spoolers, Reels, Warpers, Slashers, Winders, Looms, Shearing Machines, Balling Machines, Folders, Stamping Machines, Sewing Machines, Size Pumps, Size Kettles, Drawing-in Frames, Baling Presses, Indigo Grinders.

Worsted Machinery: Spinning Frames with caps, rings or flyers, Dandy Rovers and Reducers, Cone Second Finishers, Reducers and Rovers, Gill Boxes for Drawing, Preparing and Finishing, Weigh Boxes and Drawing Boxes, Cap Trap, Flyer and Ring Twisters.

Plans, Specifications and Estimates furnished upon application.

Lowell Machine Shop

LOWELL, MASS.



Two New
Large Size
Spinning Spindles.

We make

Draper,
Whitin,
McMullan

and other
types of

Spindles;

also

Northrop Looms,

Twisters,
Warpers,
Spoolers,
Reels,

Banding Machines,

etc., etc.

Draper Company,
HOPEDALE,
MASS.

THE EMPHATIC SUCCESS OF OUR "IDEAL" AUTOMATIC LOOM IS DUE TO SEVERAL SALIENT POINTS OF SUPERIORITY OVER ALL COMPETITORS:

1st. The ease and smoothness with which they start up.

2d. The acknowledged superiority of the cloth woven.

3d. Simple and thoroughly mechanical construction, assuring freedom from the constant breakage and expensive repairs attending other automatic looms.

4th. No special bobbins, shuttles or other expensive parts.

5th. Ability to use cop or bobbin filling interchangeably.

6th. Superiority of warp stop motion which does not break or fray the softest yarn.

7th. Of the thousands in operation not a single bobbin or crank shaft broken.

IN PROOF OF CLAIMS WE POINT TO THOSE MILLS FORMERLY USING OUR COMPETITORS' LOOMS THAT ARE NOW USING OURS.

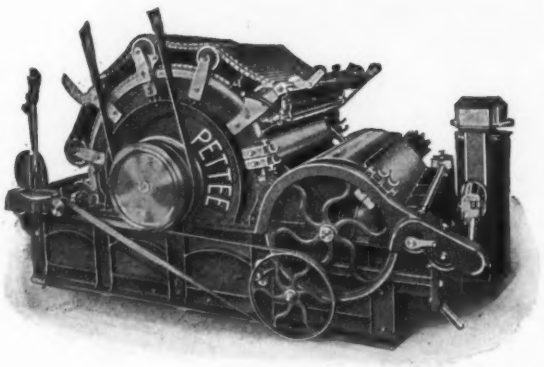
The Stafford Company

Readville, Mass.

Saco and Pettee Machine Shops

NEWTON UPPER FALLS, MASS., U. S. A.

COTTON MACHINERY



Revolving
Flat Cards,
Drawing
Frames,
Railway Heads,
Slubbing,
Intermediate
and
Roving
Frames,
Spinning Frames,
Spoolers
and
Reels.

Shops—

Biddeford, Me.

Newton Upper Falls, Mass.

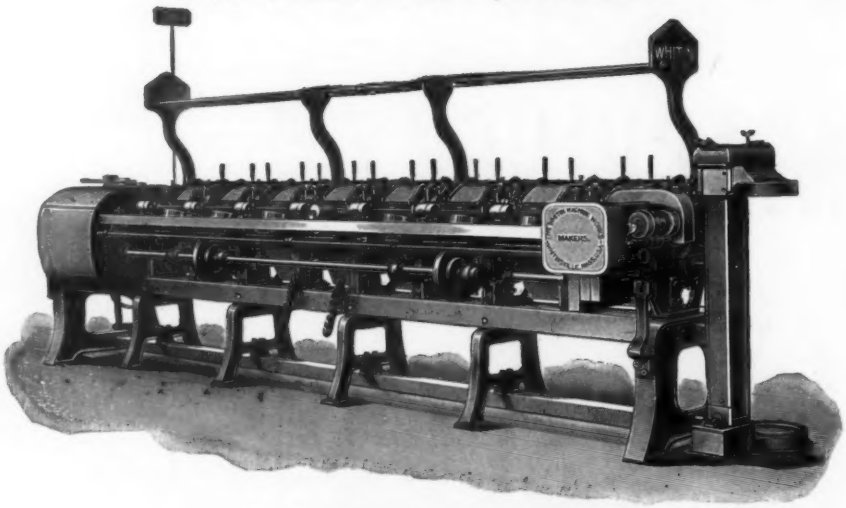
Southern Agent, A. H. WASHBURN, Charlotte, N. C.

THE

WHITIN MACHINE WORKS,

Cotton Machinery

WHITINSVILLE, MASS.



HIGH SPEED COMBER 1906 MODEL.

Revolving Flat Carding Engines,
Sliver Lap Machines,
Ribbon Lap Machines, Combers,
Railway Heads, Drawing Frames,
Spinning Frames, Spoolers, Twisters,
Long Chain Quilling Machines, Reels, Looms.

Southern Agent,
S. W. CRAMER

Trust Building, CHARLOTTE, N. C.
Equitable Building, ATLANTA, GA.

"Kitson Products"

Blowing Systems

For Conveying Bale Cotton
from Storehouse to Picker-room

Self-Feeding Openers
Lappers and
Cleaning Trunks

Waste-Working Machinery

Raw Stock Cotton Dryers

We own the Patterns and can furnish REPAIR PARTS for PICKERS
formerly built by

WHITEHEAD & ATHERTON, . Lowell, Mass.
ATHERTON MACHINE CO., - - Lowell, Mass.
A. T. ATHERTON MACHINE CO., Pawtucket, R. I.

Kitson Machine Shop

Lowell, Mass.

SCOTT & WILLIAMS

2079 E. Cumberland Street, Philadelphia, Pa., U. S. A.

BUILDERS OF

Full Particulars, Samples and Special Catalogues on Application.

Rib Knitting Machinery for Underwear and Hosiery

Plain, Single Lever or with Welt, Slack Course and Automatic Slackening Device for Welt.

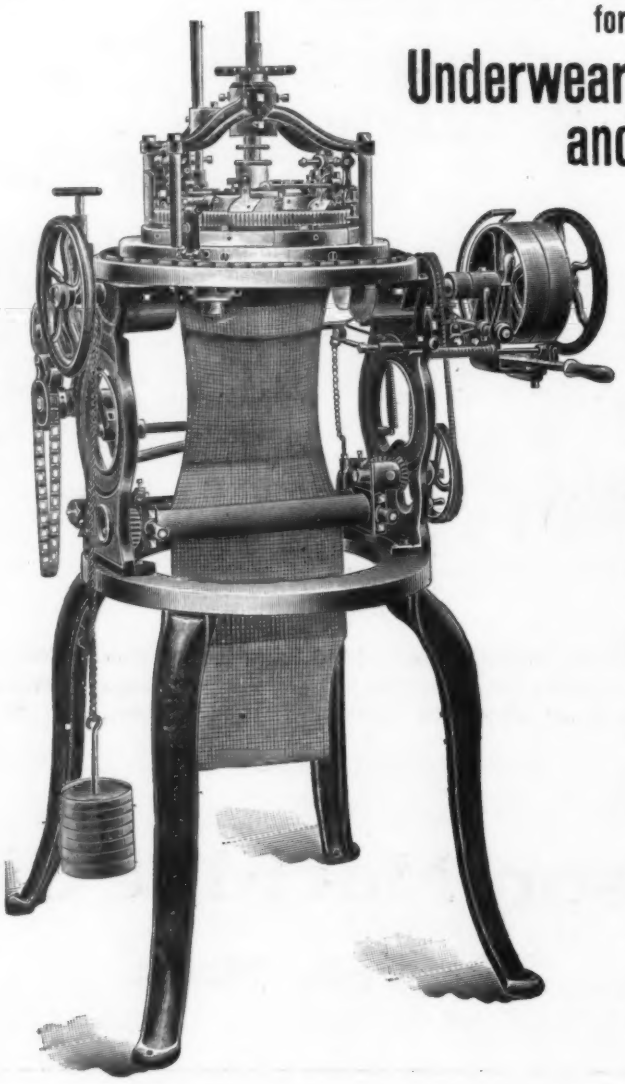
Improved Measuring Device, by actual length knit.

Sizes 8 to 24 inches, inclusive, varying by one inch.

Number of Feeds, 4 to 12, according to style and diameter of machine.

Solid Forged Steel Cylinders, specially hardened or with patent inserted walls for fine fabric.

Special Machinery for Sweaters, etc.



The illustration shows our

Improved High Speed Single Lever Automatic Ribbed Underwear Machine

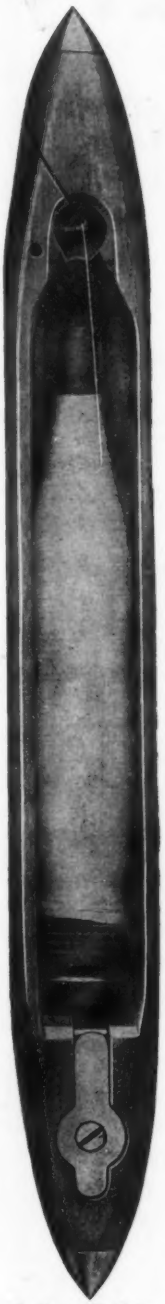
for making ladies' and gents' ribbed underwear, union suits, etc., plain and shaped.

We build Loopers, Ribbers and other Machinery for Knitting Mills

As well as

A Complete Line of Full Automatic and 7-8 Automatic Seamless Hosiery Machinery.

Yarn in the shuttle is almost cloth.



Ordinary Bobbin in Shuttle

After it passes through the many costly processes of spinning and finishing,

Waste in the shuttle means manifold loss.

THE NEW UNIVERSAL FILLING BOBBIN STOPS THIS WASTE.

FURTHERMORE:

1. It contains from two to three times more yarn than the ordinary bobbin or cop, thus reducing materially the number of loom stops to replenish filling.
2. It delivers every inch of yarn in the shuttle without break or "slough off," thus largely reducing seconds.
3. It eliminates half the number of bobbins at present required.
4. It obviates conditioning to prevent kinking.

Write for Descriptive Circular of

THE

No. 90 Universal Bobbin Winder

A SELF-OILING, HIGH SPEED MACHINE GIVING A MAXIMUM PRODUCTION IN A MINIMUM FLOOR SPACE.

UNIVERSAL WINDING MACHINES

are at present in successful use all over the world; they are built in various styles for **coning** and **tubing** of yarns single end, doubled for **twisting** and **multipled** for wire **insulating**, also for **thread, twine** and **cord,** as well as for **narrow loom quilling** and specialties: they are the **most economical** winding machines a mill can install because they are built for durability and turn off the **largest production** both per **spindle** and per **operative.**

Universal Winding Company

95 South St., BOSTON, Mass., U.S.A.

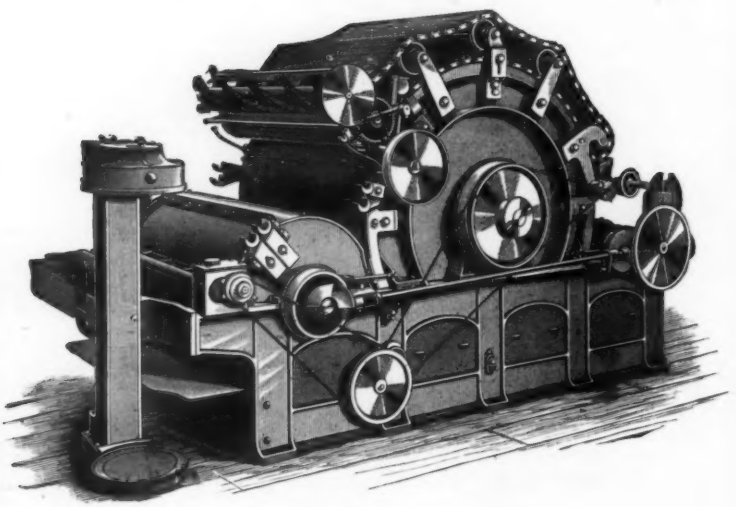
UNIVERSAL Bobbin in Shuttle

Cotton Machinery

MASON MACHINE WORKS,

TAUNTON, MASS.

Southern Office,
Charlotte,
N. C.



Cards,
Combers, Railway
Heads, Drawing Frames
Spinning Frames, Mules and Looms

INCLUDING

Plain and Fancy Silk Looms

EVAN ARTHUR LEIGH

232 Summer Street (opposite the South Station), Boston, Mass.

SOLE AGENT

IN THE UNITED STATES AND CANADA FOR

Platt Bros. & Co., Ltd.

BY FAR THE LARGEST MAKERS IN THE WORLD OF

Cotton, Woolen and Worsted Machinery

Platt's Patent Opening and Picking Machinery.
Platt's Cotton Comber will comb from 7-8" stock to Sea Islands.
Platt's Special Machinery for Making Cotton Waste into Yarns.
Platt's Special Machinery for Making French Worsted Yarns.
Platt's Woolen and Worsted Carding Engines, Special Designs.
Platt's Cotton, Cotton Waste, Woolen and Worsted Mules.

MATHER & PLATT, LTD.

Dyeing and Finishing Machinery.
Archbutt-Deeley System for purifying and softening water.

TEXTILE MACHINERY ASSOCIATION, LTD.

Flax, Hemp and Jute Machinery.

GEORGE HODGSON, LTD.

Looms for Worsteds, etc.

THE PATENT AUTOMATIC FEEDING MACH. CO., LTD.

Patent Feeding Machines for wool, cotton, flax, fur and fibrous material.

JOSEPH SYKES BROS.,
Card Clothing for Cotton.

JAMES CRITCHLEY & SON'S,
Card Clothing for Woolen and Worsted.

DRONSFIELD BROS'.

Grinding Machinery and Emery Filleting. The Best French and English Combing and Rubbing Aprons. Harding's Pins and Circles. Varey's Fallers, etc.

Relief From Thin-Places

is a problem which seriously handicaps the mills running Automatic Iron Breast Beam Looms without the

Clayton & Bentley

AUTOMATIC THIN-PLACE PREVENTER

The large number of mills, both North and South, that have installed this attachment no longer have this serious defect in their product, and consequently dispose of their product with greater ease and at better prices than their competitors.

Under present conditions of the cloth market—buyers are very critical—the device pays for itself every ninety days to six months, therefore it is easy to understand why *more mills have installed this attachment within the last ninety days* than for any equal period since the device has been on the market.

Inquiries and orders handled promptly.

MANUFACTURED BY

CLAYTON & BENTLEY CO., Atlanta, Ga.

SLASHER CELLS

¶ A set of four cells placed under your present slasher cylinder will increase your production 20%.

¶ The cost is but nominal.

¶ The cells can be put in place any evening and the slasher will be in use at the regular time in the morning.

¶ We carry these cells in stock and ship them on trial. We guarantee results.

CELL DRIER MACHINE CO.
TAUNTON, MASS.

THE CELL DRIER

Now is the Time to Equip With New Process Noiseless Pinions

There are doubtless some places about every plant where the racket made by metal gears is a nuisance and the quiet running of New Process Noiseless Pinions would be a vast improvement. The pressure of business, however, for the past two years has kept most factory managers so busy that they have had no time to consider such refinements of their equipment. The present slackening in the rush should be taken advantage of to look into this matter and to prepare to have the benefit of Noiseless Gearing during the busy times which are soon to come. We will be glad to send our descriptive catalog for the asking.

The New Process Raw Hide Company

Syracuse, New York

JAMES HUNTER MACHINE CO.

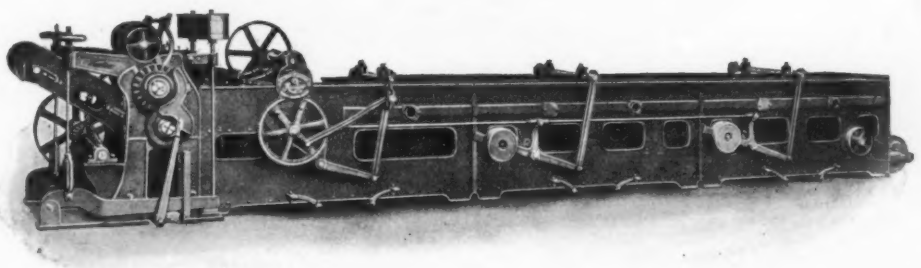
NORTH ADAMS, MASS., U. S. A.

Wool Washers. *Bulletin 54*

The Hunter

MODEL D

WOOL WASHER



Parallel Rake.

Not "A Has Been." Not "A Going To Be"
but a present day success.

Bowls 36" or 48" wide; 16-24-32 and 40 feet long.

Better work and more of it.
Large Settling Bowl giving clean scouring liquor.

Self Contained Flushing Appliance.

Better investigate.

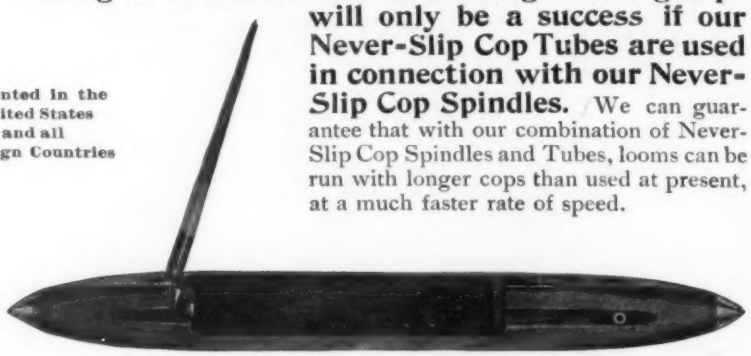
Never-Slip
Cop Spindles and Tubes

Never-Slip Cop Tube

Patent applied for.

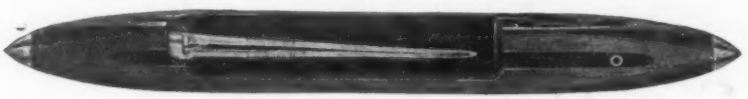
Filling-Waste is reduced to nothing and long Cops will only be a success if our Never-Slip Cop Tubes are used in connection with our Never-Slip Cop Spindles. We can guarantee that with our combination of Never-Slip Cop Spindles and Tubes, looms can be run with longer cops than used at present, at a much faster rate of speed.

Patented in the United States and all Foreign Countries



Shuttle with Spindle Raised

U. S. Patents: 778851, Jan 3, 1905; 790611, May 23, 1905; other patents pending



Shuttle with Spindle Lowered

U. S. Patents: 778851, Jan. 3, 1905; 790611, May 23, 1905; other patents pending

American Textile Specialty Machinery Co.

MANUFACTURERS OF

Shuttles and Shuttle Irons for all Textile Purposes.

New York Office, 363-373 Rider Ave.

670 Eddy St., Providence, R. I.

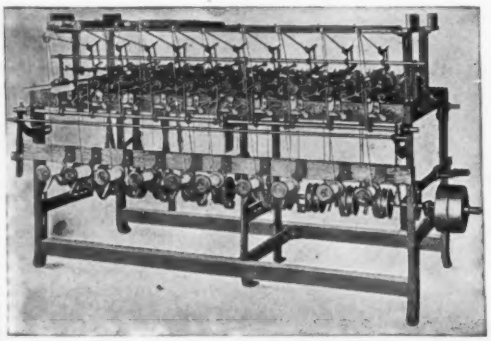
OSWALD LEVER CO.

(Formerly LEVER & GRUNDY.)

Lehigh Ave. and Mascher Sts., PHILADELPHIA, PA.

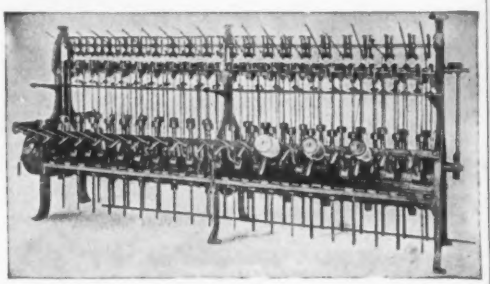
MANUFACTURERS OF TEXTILE MACHINERY.

SOLE MAKERS OF OUR PATENTED SPECIALTIES IN THE UNITED STATES.

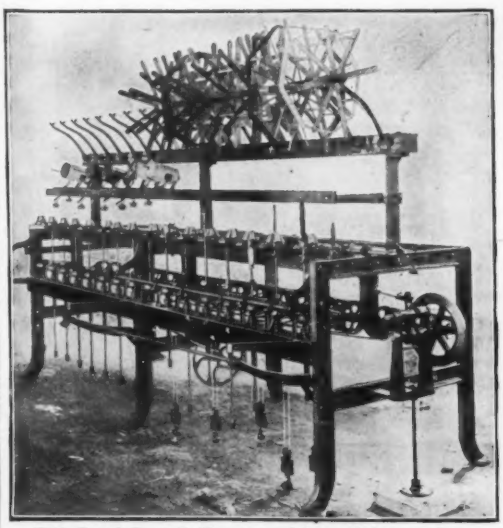


This Machine may be arranged to wind from skeins, spools, cones, or any kind of spinning bobbins. Most suitable machine for cotton or woolen blankets.

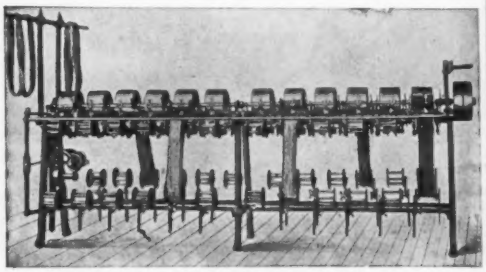
Conical and Parallel Tube Winding Machines; Warping Machines and Creels; Brass Bobbin Winding and other Machinery for lace mills; Chenille Cutting Machines, Sectional Warping Mill, Beaming Machines, etc; Cop Winding Machines for butts to weave from outside; Filling Bobbin or Quill Winding Machines; Vertical Spindle Spooling Machine for silk, fine cotton, wool and worsted; Variable Speed Bobbin Machines for large bobbins used in knitting mills; Dresser Spooling Machines; Reeling Machines.



Vertical Spindle Gear Driven Winder, as used by all manufacturers of heavy duck, jute, cotton, bagging and carpets.

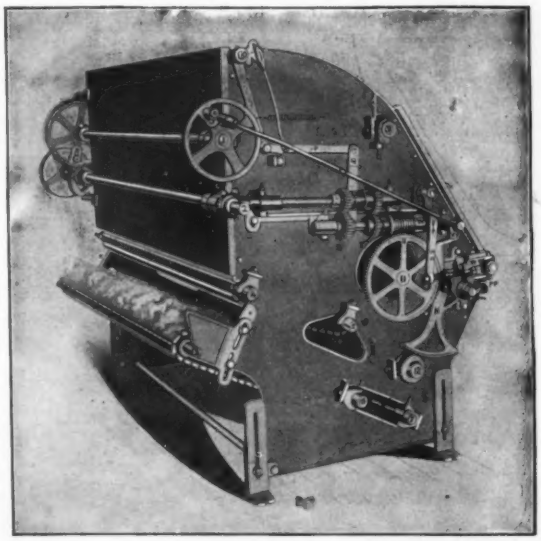


High Speed Cross Quiller to wind from skeins, spools or mule cops on two quills or paper tubes. It is built to run from 1800 to 2400 revolutions.



Pressure Drum Spooling Machine. This machine is adapted for spooling any kind of yarn, whether from mule cops or skeins.

THE FISHER PATENT CARD FEED



Write Us For List of Mills Where Machines Are Used.

Woonsocket Machine and Press Company

WOONSOCKET, R. I.

PRACTICAL FIRE PROTECTION

If you want your mill buildings properly protected against the fire hazard, thereby obtaining the lowest insurance rates, you must have a supply of water which is instantly available under high pressure and absolutely independent of the successful or immediate operation of pumps or other machinery. The old method of storing such a supply was by wood tanks, generally built on top of buildings. As these tanks are short lived they soon become, themselves, a menace to the building instead of a protector. The sudden bursting of such a tank has often done as much damage as a fire. The up-to-date method of storing water is by means of a steel tank on a steel tower. We make a specialty of the design, manufacture and erection of these tanks of any desired capacity, in any part of the country, to meet any local conditions. Our tanks are recommended by the Factory Mutual Insurance Companies and endorsed by all of our past customers. We have built about seven hundred towers and tanks in all parts of the country, about 50 of which have been erected for Textile Mills. Every one of these is giving satisfaction. Write for booklet No. 7 which gives a list of all our customers with whom we invite you to correspond. The cut shows a tank which we built for the Belton Cotton Mills, at Belton, S. C. The large tank is kept full at all times for fire protection; the small one supplies water for use in the buildings.

Chicago Bridge and Iron Works

105th and Troop Sts. Chicago, Ill.

The Buffalo System

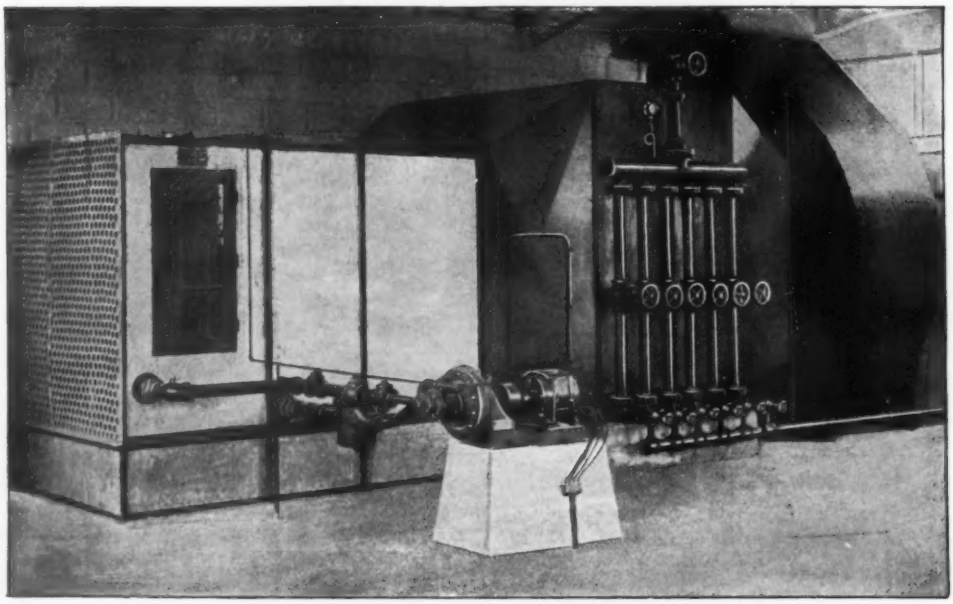
of

Atmospheric Conditioning

Is designed with a scientific and practical insight into textile mill requirements.

HUMIDIFIES — COOLS — CLEANSES — VENTILATES — HEATS

With Perfect Automatic Control.



Compact to install. Simple in operation, requiring practically no attention.

Write for Catalog 97 T. W., which illustrates and explains fully this distinct departure from other types of humidifiers.

Buffalo Forge Co.,

Buffalo, N. Y.

The Turbo-Humidifier

Do you know why the **Turbo-Humidifier** was invented? Well, I'll tell you!

Because there seemed to be room for an improvement in humidifying methods. The trade seemed to be waiting for a small, compact, simple, economical humidifier.

"No bigger than a safety razor" was an accident, but the performance of the **Turbo** was not. For it was designed by a practical mill man who went at the problem as a problem—with no thought, at first, of making humidifyers to sell.

After a year's use the Amoskeag Mfg. Co., where the inventor is Mechanical Supt., will extensively extend the use of this system between now and hot weather.

Do you imagine this is done to gratify Thompson's pride? Not so the casual observer would notice it. Remember the **Turbo-Humidifier** has no moving parts; no sheet metal contraptions; no belts; no pulleys! No cumbersome strainers, cloths and things to keep clean.

Write us if you are interested.

The G. M. Parks Co., Sole Agent **Fitchburg, Mass.**

STARCH.

Increased efficiency in

WARP SIZING

with LESS COST by using

Adhesive Value:

One pound of "C. P. SPECIAL" contains a sizing value of from one to one and a half pounds of any other starch.

"C. P. SPECIAL" requires no heavying or stocking up after standing.

Sizing Qualities:

"C. P. SPECIAL" dries without sticking on slasher cylinders.

"C. P. SPECIAL" penetrates yarn thoroughly.

"C. P. SPECIAL" increases tensile strength of yarn from 5–10 percent.

"C. P. SPECIAL" boils quickly and produces good, smooth size.

Weaving:

Warps sized with "C. P. SPECIAL" draw in and weave to entire satisfaction.

"C. P. SPECIAL" will not dust off under your looms.

Demonstration:

We are ready to demonstrate in your mill—free of cost—just what "C. P. SPECIAL" will do.

100 lbs. "C. P. SPECIAL" will be sent on request to any responsible Cotton Manufacturer for demonstration purposes.

Corn Products Refining Co., New York, N. Y.

TAPES, BRAIDS AND RIBBONS

for the Mill and Manufacturing Trade

WICK NARROW FABRIC CO.
PRODUCERS OF SPECIALTIES
726-728 Market Street, Philadelphia
Address Department Z

ESTABLISHED 1828.

Boston Belting Company

ORIGINAL MANUFACTURERS

VULCANIZED RUBBER GOODS.

Rubber Covered Rollers

NEW ROLLERS COMPLETE. *ROLLERS RE-COVERED.*

We furnish Rubber Covered Rollers for all purposes for which such rollers are or can be used in Textile Mills. The quality of our rubber coverings is rigidly maintained at its well known high standard — resulting in satisfaction and the greatest economy to the user.

The Trade-Mark of Excellence on all kinds of

HIGH GRADE MECHANICAL RUBBER GOODS

Rubber Belting

of superior quality for power transmission and the conveying of materials. Our large stock enables us to make prompt shipments.

Hose

all kinds for water, steam, air, fire protection, suction, etc. Our "AMERICAN UNDERWRITERS" Hose meets the reqnirements of all Insurance Companies.

Pump Valves, Gaskets, Springs, Washers, Etc.

JAMES BENNETT FORSYTH, Mfg. Agt. and Gen. Mgr.

Boston New York Buffalo Baltimore Atlanta New Orleans

The Sentinel
Electric Warp Stop Motion

with spring wire detector head for plain weaves.

Each detector wire controls two threads making this Stop Motion especially adapted for high sley goods. The position of the broken end is distinctly indicated.

WE CALL SPECIAL ATTENTION TO OUR

New Drop Wire
Warp Stop Motion

for both plain and fancy weaves

Each detector wire controls a single thread and clearly indicates the position of the broken end. By a new form of drop wire, positive contact is assured and maintained, insuring instant stopping of the loom.

American Textile Appliances Co.

79 Milk Street, Boston, Mass.

William Firth, Treasurer

Established 1865

Jacob K. Altemus

2824 North 4th St., Philadelphia, Pa.

My Business Is—

¶ To keep in touch with every kind of fabric, how they are made and what is needed;
¶ To meet the requirements of successful operation, get quality and quantity of output and economy in production;
¶ To produce the machinery needed for the highest development of the various departments;
¶ To command confidence and respect in all business relations;
¶ To secure and maintain such relations is my constant aim and sole object.
¶ To have a reputation that shows both confidence and square dealing.
¶ To know that my methods are appreciated and make greater efforts in the future.

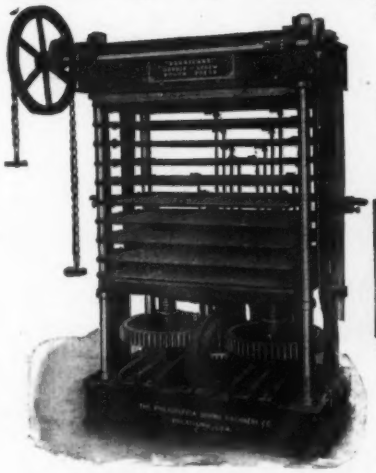
Information regarding machines now in use and for future requirements solicited. To those interested, a descriptive list of machines guaranteed to give results will be sent.

Textile Machinery for all kinds of Yarns.

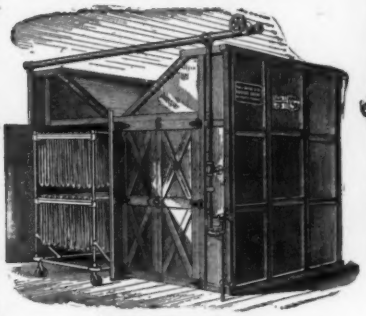
"HURRICANE" DRYERS AND FANS

For Wool, Cotton Stock, Yarn, Stockings, Underwear, Etc.

BELT DRIVEN AND MOTOR DRIVEN



Power Screw Hydraulic and Lever **Presses**



Truck Yarn Dryer.

"Hurricane" Fan, Style No. 2. Write for Catalogues.

COMPLETE EQUIPMENTS FOR DYEING, SCOURING, BLEACHING, CARBONIZING, OXIDIZING, CHROMING, Etc.

PHILADELPHIA DRYING MACHINERY CO.

6721 Germantown Ave., Philadelphia, Pa.

The QUALITY of the goods, as well as QUANTITY, is determined by the methods of manufacture.

THE MILL EQUIPPED WITH

"The Reeves" Variable Speed Transmission

for regulating the speed of the tenters, dryers, mangles, printing, bleaching, dyeing and mercerizing machines, etc., produces the best and the most at the lowest cost, because it gives the ***exact speed*** best suited to the work.

ASK THOSE USING IT.

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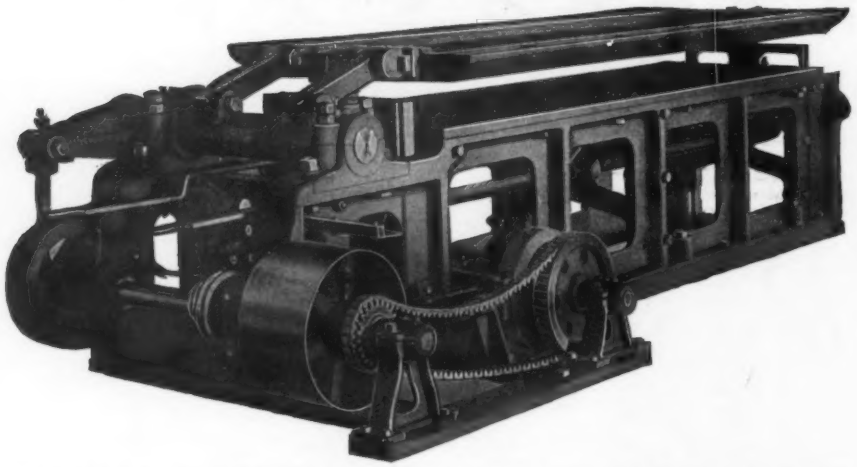
Columbus, Indiana.

New England Agents,
Cell Drier Machine Company,
Taunton, Mass.

New York Representatives,
Patterson, Gottfried & Hunter,
146-150 Centre Street.

Farrel Foundry & Machine Co.

ANSONIA, CONN.



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Chilled and Soft Iron Rolls. Heavy Transmission Machinery.
Machine Moulded and Machine Cut Gearing, to 20 ft. diameter, Etc., Etc.
Heavy Castings, in Gray Iron or Semi Steel.

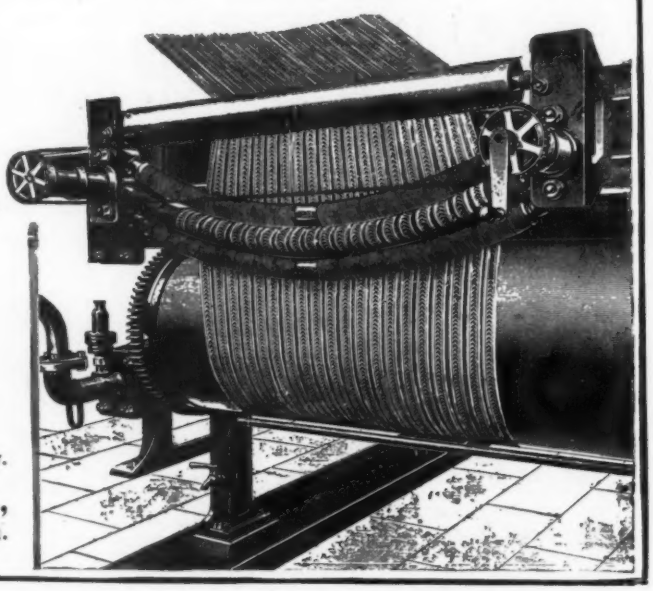
Perfectly Even Tension Both Ways

THIS ideal cloth expander gets the full width of the goods in a most satisfactory way. Can be attached to calenders or cans. Hundreds in use in Great Britain and on the Continent—hundreds more in the United States, with constant satisfaction.

Manufacturers unsolicited say to us, "You have the greatest thing in a spreader ever brought to our attention."

We put them in on trial.
Test it on your own work—'t will pay.

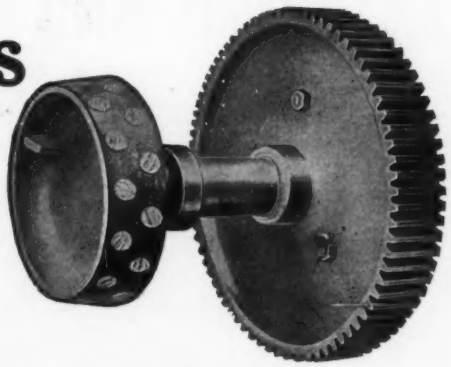
Thomas Leyland & Co.,
60 India St., - - - Boston.



Cork Inserts

(Patented)

greatly increase Mule Friction efficiency.



Cork Inserts give quick, positive action, without gripping, thus preventing breakages. **Cork Inserts** have great frictional qualities and transmit ample power to keep the machines up to their full capacity all the time, which means larger output. **Cork Inserts** eliminate all seizing, thus greatly lessening the wear and tear on the machines.

Now in use

on foreign and domestic Mules in the Wood Worsted Mills. Look them up for your mill— the cost is small.

Write for particulars.

National Brake & Clutch Co., 16 State St., Boston

LAWSONS

Hope Foundry, LEEDS, England

BRANCH OF

Fairbairn Lawson Combe Barbour, Ltd.

MAKERS OF MACHINERY FOR

Preparing and Spinning

Flax, Hemp, Tow and Jute

Special Machinery for the Manufacture of Twines, Rope Yarns and Binder Twine

Good's Combined Hackling and Spreading Machine.

Long Reach Screw-Gill Drawing Frames. Chain-Gill Drawing Frames with Apron Heads.

Patent High-Speed Horizontal and Automatic Spinning Frames for Manila.

Improved Laying Machines.

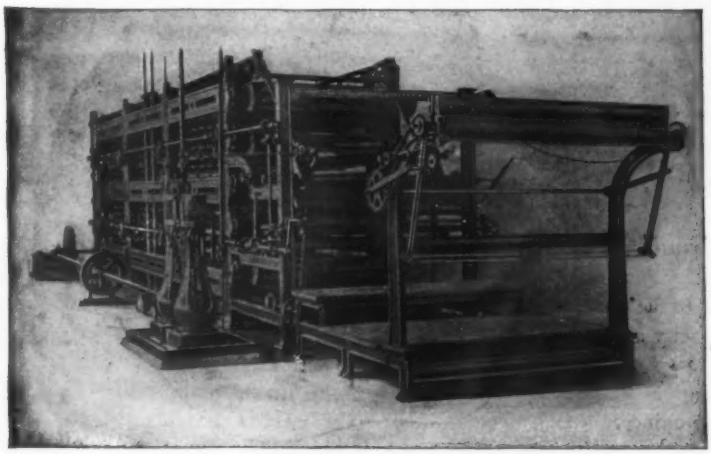
Haskell-Dawes Tubing Twisters.

Brownell's Patent Twisting and Laying Machines for Twine.

N. B.—Complete Plans and Estimates for Flax, Tow, Hemp and Jute Mills, Trawl Twine Factories and Steam Ropeworks.

TENTERING AND DRYING MACHINES

WITH LOW DOWN FEED. **PATENTED FEBRUARY 26, 1895.**



Tentering and Drying Machines on Pipe System. Special Dryers for Heavy Felt Goods. Hot Air Drying and Tentering Machines.

Fulling Mills, Washers, Chinchilla and Whitney Machines, Whipping Machines, Cone Willows, Marsden & Blamire Lap Feed, Dyeing Machines for Piece Goods, Soaping Machines, Wringing Machines, Jigs (Double or Single), Dewing Machines, etc. Crabbing Machines for worsted. Made either single, double or triple.

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D. R. KENYON & SON, Raritan, N. J. **Successors to KENYON BROS.**

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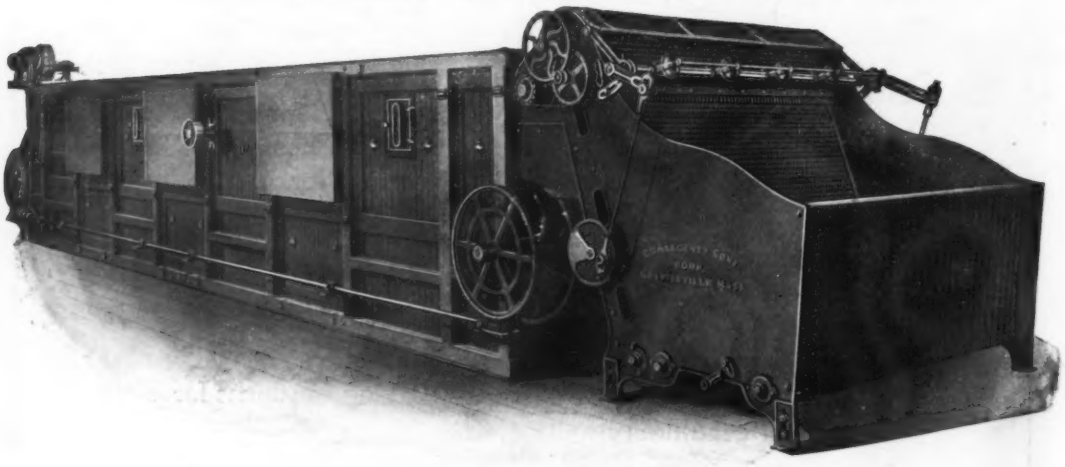
GRANITEVILLE, MASS.



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Stock Dryers, Wool Washers, Wool Dusters, Carbonizing Plants, Burr Pickers, Etc.

WM. FIRTH, Pres. EDWIN BARNES, Vice-Pres. JOHN H. NELSON, Treas.

WILLIAM FIRTH CO.

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ASA LEES & CO., Limited,

TEXTILE MACHINERY,

OF EVERY DESCRIPTION FOR COTTON, WOOLEN AND WORSTED.

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R. CENTNER FILS, Heddles.
GOODBRAND & CO., Yarn Testing Machinery, Wrap Reels, etc.
JOSHUA KERSHAW & SON, Roller Skins, etc.
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BRADFORD STEEL PIN CO., Comber Pins.
CLAPHAM, SMITH & CO., Caps, Tubes and Spindles for Worsted, etc.

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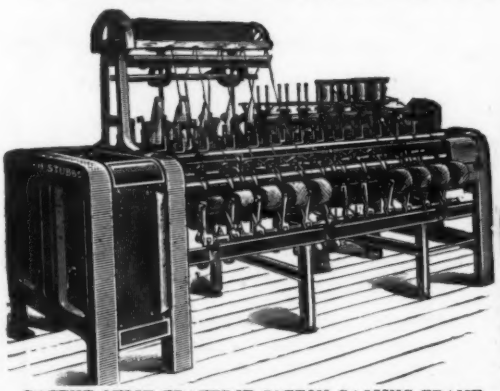
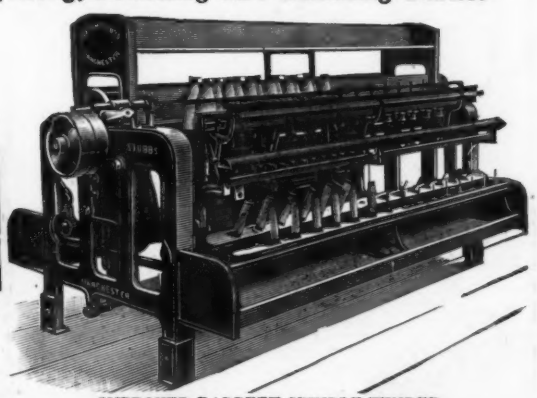
SPECIAL MACHINERY

For Winding, Gassing, Reeling, Preparing, Polishing and Bundling Yarns.



PATENT QUICK TRAVERSE COTTON GASSING FRAME.



IMPROVED RABBETH SPINDLE WINDER.
With Patent Tapering Motion, for Single Flanged Bobbins.

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DOBBINS' ELECTRIC SOAP, ABSOLUTELY PURE AND UNIFORM.

Dobbins' Hard Water Soap, a Specific for Hard Water or Water Charged with Chemicals.

AMMONIATED POTASH SALTS FOR SCOURING.

Dobbins' Palm Oil Fulling Soap. Dobbins' "Fast Black" Soap. Pure Olive Oil Potash Soaps.

FREE SAMPLE SENT FOR TRIAL ON REQUEST.

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SPINDLES

EASTON AND BURNHAM MACHINE CO.

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REPAIRS FOR RABBETH SPINDLES

To the acknowledged benefits, such as increased quantity and better quality of product, resulting from driving textile machinery with individual electric motors, there must be added that of reducing the chances of accidents. Belting is perhaps responsible for as many accidents to operatives in textile mills as any other cause. Belting is entirely eliminated by the introduction of individual electric motors. This is a point deserving the most careful consideration of mill owners.

Ask Westinghouse Electric.

Westinghouse Electric & Mfg. Co.
Pittsburg, Pa.
Sales Offices in all Large Cities.

LOWELL TEXTILE SCHOOL

Fits for the best positions in all branches of the textile industry both commercial and manufacturing.

Complete courses in Cotton Manufacture, Woolen and Worsted Manufacture, Designing, Chemistry and Dyeing and Textile Engineering. All courses include thorough training in Mechanics, Advanced Mathematics, Mechanical Drawing, Chemistry, Decorative Art, Weaving, etc.

Complete equipment for applied instruction.

For Catalogue Address

CHAS. H. EAMES, S. B., Principal,
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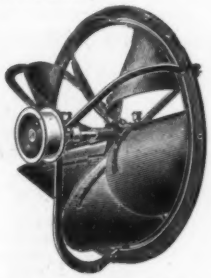
Don't use more expensive, less efficient methods-- Get a Berry Wheel.

'Tis the ideal dollar-saving way of drying textiles—extracts the moisture from all kinds of fabrics in the quickest, most economical and best way. That's why Berry Wheels are used by representative mills.

This is our Berry Wheel, the most effective agent for moving air, eliminating steam and other impurities in the atmosphere.



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23 West First Street,
BOSTON.

E. B. BADGER & SONS CO.
ESTABLISHED 1841
COPPERSMITHS

STEAM JACKET KETTLES

Guaranteed to stand 150 lbs. cold-water test.

Equal, if not Superior, to any in the market

66 Pitts St.
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Mass.

It Attracts Universal Attention Because it is THE BEST

BADGER'S
Fire Extinguisher

Has taken the lead in the United States, and is everywhere recognized for its efficiency. After competitive tests, lasting more than one week, THE UNITED STATES GOVERNMENT placed an order for 1,200 of

BADGER'S THE LATEST AND MOST APPROVED
Automatic, Chemical, Hand Fire Extinguisher Made

BADGER FIRE EXTINGUISHER CO.
42 Portland St., Boston, Mass., U. S. A.

Crabbing, Steam Finishing, Opening and Folding, Tacking, Sewing, Squeezing Machines

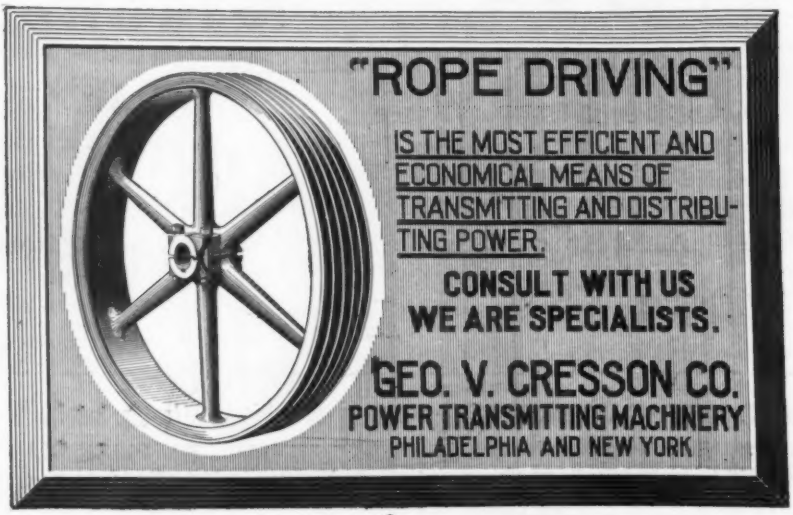
BIRCH TREE

BIRCH BROTHERS, SOMERVILLE, MASS.
ALBERT BIRCH, TEXTILE MECHANICIAN

BIRCH TREE

Bleaching and Napping Machinery

BULLETIN ON ESSENTIALS OF ROPE DRIVING .


"ROPE DRIVING"
IS THE MOST EFFICIENT AND ECONOMICAL MEANS OF TRANSMITTING AND DISTRIBUTING POWER.
CONSULT WITH US
WE ARE SPECIALISTS.
GEO. V. CRESSON CO.
POWER TRANSMITTING MACHINERY
PHILADELPHIA AND NEW YORK

NOW READY FOR DISTRIBUTION. SEND FOR COPY

Plenty of soft water for washing, scouring, bleaching and dyeing purposes at small expense

Hard water is a source of large and constant loss—it wastes soap and dye-stuffs, causes spots, stains and streaks, uneven shading, make the goods stiff and harsh.

A Bartlett Water Softener

furnishes water that is ideal for use in all textile processes and enables you to get results impossible to obtain with hard water. Much of the superior finish and appearance of foreign goods is due to the almost universal use of softened water in their manufacture. SEND FOR BOOKLET.

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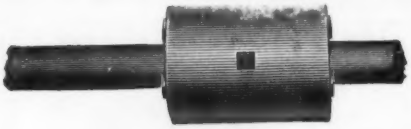

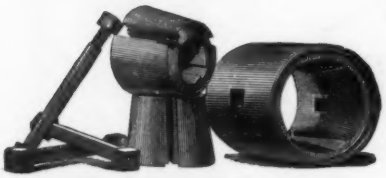

THE "SELLERS" MAKE OF

DOUBLE CONE VISE COUPLING

has a way of holding shafts together, that no other COUPLING can equal.

WILLIAM SELLERS & CO., INCORPD.

PHILADELPHIA, PA.

Makers of

SHAFTS,
COUPLINGS,
PULLEYS,
HANGERS,

and all most approved appliances for the Transmission of Power.

SEND FOR CATALOGUE AND PRICE LIST.

MACHINE TOOLS.
INJECTORS. POWER CRANES.

General Electric Company

Continuous Daylight for Your Mills

is obtainable by the use of

General Electric Arc Lamps with Concentric Diffusers

This system is best because it is the only mill lighting system that gives a perfectly distributed light that is Similar to Daylight.

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Principal Office: Schenectady, N. Y.

Sales Offices in all large cities.
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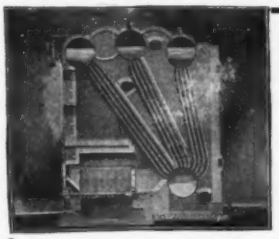

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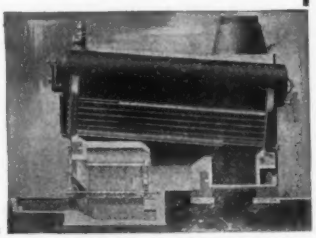
Burns Slack with Great Economy

The Murphy can be installed under any type of fire-tube or water-tube boiler and to units of any size.



SETTING UNDER TWO TYPES OF BOILERS SHOWN HEREWITH

MURPHY IRON WORKS

DETROIT, MICH.

Hydro-Extractors, Exhaust Fans, Dye Tanks and Tubs.

Adjusts itself to an uneven load, runs without vibration. Unusual capacity for high-class work.

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Tolhurst Machine Works,
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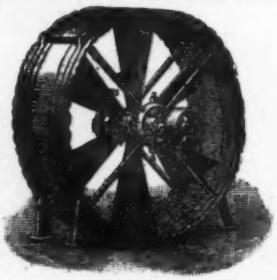


Moves more air than any other fan made. Very efficient under widely varying conditions. Noiseless and does not obstruct the light.

SALEM ELEVATOR WORKS

SALEM, MASS.

ELEVATORS

ESPECIALLY ADAPTED FOR MILL USE.

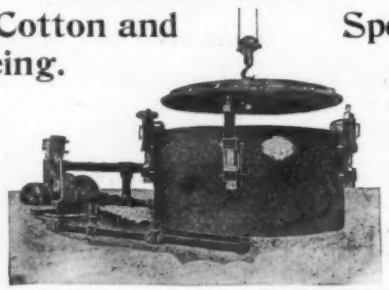
SEND FOR ILLUSTRATED CATALOGUE AND ESTIMATE.

Our latest Vacuum Dyeing Machine

WRITE US FOR PARTICULARS

For Raw Stock, Cotton and Wool Dyeing.

The only perfect machine for Sulphur Black Dyeing.



Special Advantages

Condition of Stock,
Durability,
Production,
Labor Saving.

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D. M. HEY, MANAGER.

T. FRUSHER, SELLING AGENT
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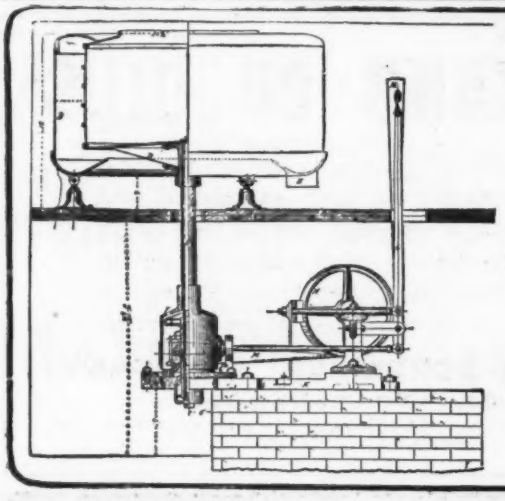


Weston Hydro Extractors.

Special Machines for Acid Work.

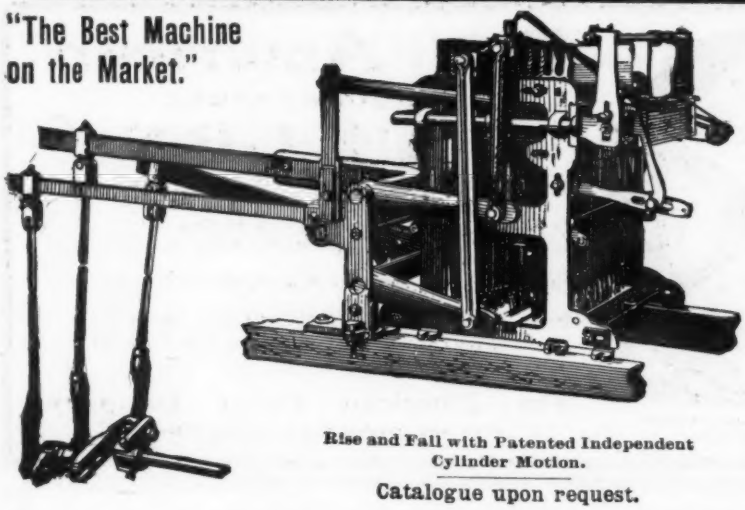
SHAFTING, PULLEYS,
FRICTION CLUTCHES, Etc.

American Tool and Machine Co.,

Incorporated 1864 Founded 1845.

109 Beach Street, Boston, Mass.

"The Best Machine on the Market."



Rise and Fall with Patented Independent Cylinder Motion.

Catalogue upon request.

USE THE

HALTON JACQUARD

Original Fine Index Machines

Single Lift, Double Lift, Double Cylinder, Rise and Fall, Crossborder,

THOMAS HALTON'S SONS,

Allegheny Avenue and C Street,

PHILADELPHIA

Representative
H. A. Forbes, Paterson, N. J.

A SPECIAL HIGH GRADE

round, spring steel is used in

Lane Canvas Basket Frames

giving all needed rigidity and at same time flexibility to a degree which prevents breaking or bending out of shape no matter what the usage. Sold direct or through principal Supply Houses.

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"BRETON" BRAND OF OILS

BRETON OIL FOR WOOL TRADE MARK

are as carefully and accurately prepared to meet textile requirements as long experience and expert chemical knowledge can devise. Only the best of materials are used and every gallon is made in our own factory. There's a "Breton" for your work. *Sent on approval.*

BORNE, SCRYMSER COMPANY,
80 South Street, New York.
Boston Fall River Philadelphia Works: Claremont, N. J.

Patented in the United States and Foreign Countries.

The American
WROUGHT STEEL
PULLEY

Is a parting PULLEY and can be applied without stripping the shaft.
It is Light, STRONG, and lasts a lifetime.
It clamps to the shaft perfectly—keys and set-screws superfluous.
Interchangeable metal Bushings to fit shafts of different sizes.
Particularly adapted to TEXTILE manufacturing.
Sold by the Leading Supply Houses all over the WORLD.

Send for Booklet.

The American Pulley Company
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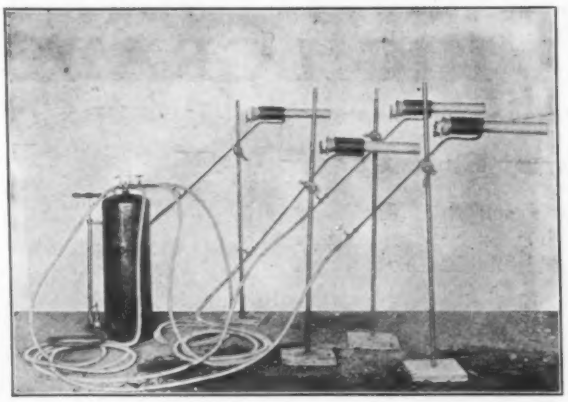


Do your own repairs
Ferrofix
Portable Brazing Plants For Sale.

Write for particulars.

The American Ferrofix Brazing Company
1515 Sansom St., Philadelphia.
Southern Agents, Riddell Bros., Atlanta, Ga.

WILLIAM FIRTH, Pres. THE FRANK B. COMINS, Vice-Pres. and Treas.

AMERICAN MOISTENING COMPANY

79 Milk Street, Boston, Mass.

Received the HIGHEST AWARD on recommendation of the FRANKLIN INSTITUTE for

"Simplicity and Originality of Design."

Is the largest manufacturer of HUMIDIFIERS in the World. The last twenty years receiving the HIGHEST AWARD in this country and Europe for its AIR-MOISTENING SYSTEM. EIGHT GOLD MEDALS and others.

The Only Perfect System of Air Moistening

Has Been Adopted by the Representative Manufacturers of this Country.

The only System adopted in the Textile Schools. Write for booklet "T" on Humidification. Legal proceedings will at once be taken against infringers and users of infringements.

J. S. COTHRAN, Southern Representative, Trust Bldg., **CHARLOTTE, N. C.**

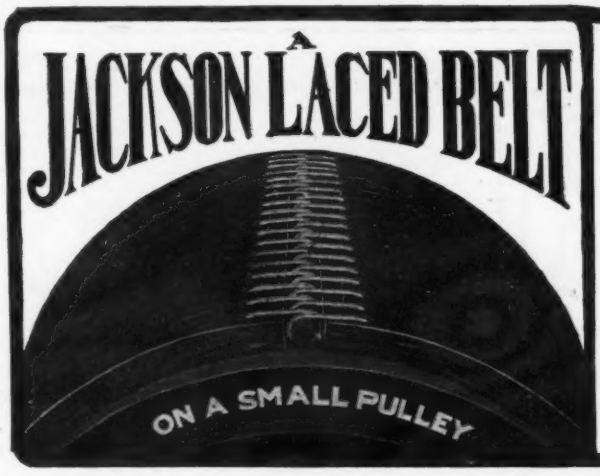
WILLIAM BODDEN & SON, Limited

The "BODDEN" Flyer

For QUALITY OF FINISH
For QUANTITY of PRODUCTION
HAS STOOD THE TEST OF YEARS

Sole Agents for U. S. A.

Thomas Mayor & Son, Olney Street, **Providence, R. I.**



Do you know when belts cling to pulleys? It's when they lie so smooth and close that air is excluded from between the two surfaces. Joints made by the

Jackson Belt Lacer

conform as closely to the pulley as any other part of the belt. No hump, consequently no slipping, pounding or strain. Economical. Convenient.

Birdsboro Steel Foundry & Machine Co.
Birdsboro, Pa.

WILSON & CO., BARNSLEY, Limited

BARNSLEY, ENGLAND.

Absolutely secure combination of Shield and Bobbin guaranteed.

Loose Shields Impossible.

Specialties: PATENT "LOCKFAST" and "CLIMAX" Shields. ENAMELLED CONDITIONING BOBBINS, Impervious to Steam, Moisture or Oil.

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GOLD MEDAL St. Louis, 1904. DIPLOMA d'Honneur Liege, 1905. Highest Awards for Bobbins.

Added Strength and Absolute Security.

Samples and Prices on Application.

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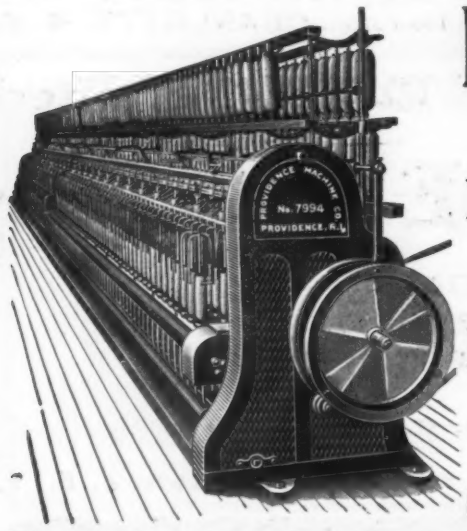
Providence Machine Co.



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Improved Cotton Roving Frames

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THE BEST FIRE HOSE MADE.

(Trade Mark.)

For use in

Cotton Mills, Woolen Mills and Factories.

Seamless Woven and Rubber lined EUREKA COTTON HOSE, has no equal. Send for circular and testimonials.

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NEW FEATURES: Wearing Parts, Valve and Seat Renewable.

Class A Return Trap

We manufacture Steam Traps for all duties, High and Low Pressures, returning the Condensation back into Boiler or Discharging to Hot Well, Tank, or Atmosphere.

No Elastic Gaskets, all Joints Ground Metal and Metal.

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ALBANY, N.Y.

Established 1870.

JAMES H. BLESSING, Pres. THOS. F. RYAN, Sect'y & Treas.

We have the Largest Exclusive Spool Manufacturing Plant in the World with a capacity of 10,000 High Grade Bushed Spools per day.

Our splendid facilities guarantee prompt and immediate deliveries. Our equipment, than which no better exists, guarantees the highest grade of all hard wood spools of the highest quality procurable at medium prices.

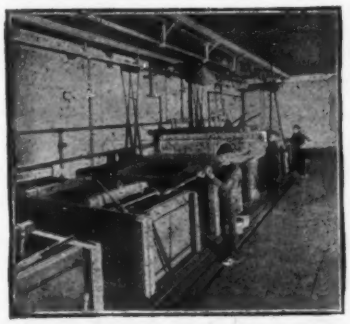
COTTON WARPER SPOOLS, COTTON TWISTER SPOOLS, WORSTED ROVE SPOOLS, CARPET CREEL SPOOLS, WORSTED REDUCER SPOOLS, WOOL WARP SPOOLS.

We can give one week deliveries on any order of the above kinds of spools.

Lestershire Spool & Manufacturing Co.,
LESTERSHIRE, N. Y.

Waters' Dyeing Machine

This cut shows a new and useful machine patented by D. F. Waters for the dyeing of any color on Worsted, Woolen, Cotton and Merino Yarns.



Being successfully operated by some of the largest manufacturers in the country.
The saving of labor will more than pay for a machine in a few months.
Capacity; 2,000 lbs. a day per man.
Machine can be seen in operation at any time at my plant where I have 13 in operation all the time.

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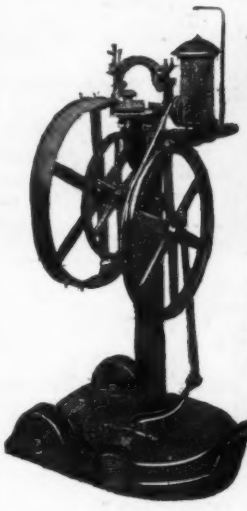

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No. 9.—Portable Foot-Power Rotary Sewing Machine

It is especially adapted for use in Cotton and Woolen Mills, Bleacheries, Print Works at the Printing Machines, in Dye Works, Cloth Rooms, at the Fulling Mill, Shears, Calendars, Gigs, Drying Machines, etc., or any of the different finishing processes in textile mills.

Manufactured by the

DINSMORE MANUFACTURING CO.,
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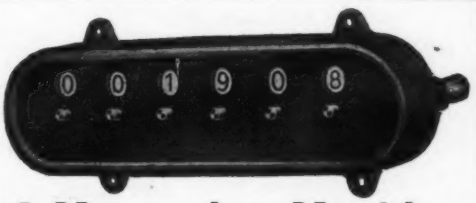

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that shows in Yards the output of each machine.

A glance tells how the machines are running —enables you to keep output up and cost down.

Used by representative Cotton Mills and Bleacheries. Write for Catalog No. 18.

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for WOOLENS, WORSTEDS, FELTS, etc.

Built Upright or Horizontal with Low Down Feed

Ventilating Fans a Specialty

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SAVE POWER BELTING BEARINGS

The soft surface grain makes SHULTZ SABLE BELTS stick close to the pulley, and the tough, flexible rawhide interior gives great driving power, without requiring high initial tension.

It will pay to use SHULTZ SABLE BELTS. They transmit from one-fourth to one-third more power, cost nothing for wasted power, time or repairs. We can show you SABLE belts that have worked steadily day in and day out for more than a quarter of a century, and are still good.

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PICKER STICKS

Better PICKERS than are Not Made

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We believe it to be impossible for anyone to produce better rawhide loom pickers than those which we are turning out right along. The hide is the best it is possible to procure and in the process of manufacturing the pickers every detail receives careful attention. The best material and careful workmanship are bound to produce satisfactory results.

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ALL STYLES AND KINDS FOR FLAT AND ROUND BRAIDS.

SOLID SASH AND CURTAIN CORDS,

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AND ALL BRAIDED FABRICS.

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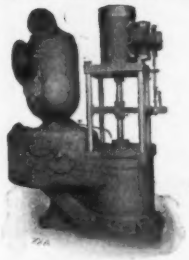
JET AND SURFACE **CONDENSERS** ELECTRIC PUMPS BELTED PUMPS, Etc.



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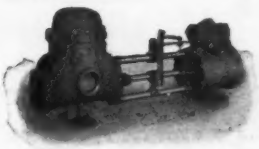
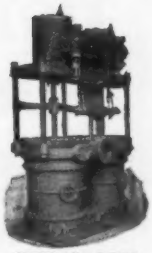
DUPLEX DURABLE PUMP



SIMPLE PUMP



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WATER TOWERS
IRON OR STEEL

for Fire Protection and Domestic Service.

Built in all sizes.

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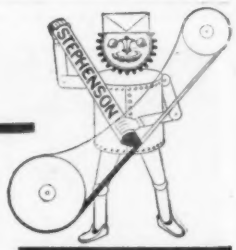

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Bar Belt Dressing

1⅞ inches in diameter is the size that best suits most men. It has just the right "feel" to it in your hands. ¶ Clean to handle; easy to apply (friction on the belt heats it,) always to be relied upon where a belt slips. STEPHENSON Dressing reflects credit on the maker, the seller and the user. Quality dressing for Quality folks. ¶ Your hardware store will sell you as little as a box of a dozen pound sticks, or give you a free sample to test.

In either case look for the Cog Wheel Face.

Red Label for Leather Belts. No ONE kind is good for ALL belts— You know that. **Green Label for Rubber or Canvas.**

PREVENT ROT AND DECAY

FLOORS, SILLS, JOISTS, TRESTLES, DYE TANKS, VATS
or other Woodwork can be successfully preserved
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Applied with brush or by dipping Always ready for use. On the market since 1875.

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L. F. FALES

MANUFACTURER AND BUILDER OF

SEWING MACHINES

FOR ALL PURPOSES WHERE A NUMBER OF ROWS OF SEAMS ARE REQUIRED

BUILT WITH ANY REQUIRED NUMBER OF NEEDLES

DESIGNER OF SPECIAL MACHINERY

WALPOLE, MASS. U. S. A.

PAPER SLITTING MACHINES

To the Manufacturer who Invites Success!

THE HENDERSON CARD

will increase your carding and improve the quality of your yarn with less waste, greater strength and increased production over any other system.

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We are thoroughly familiar with the electric requirements of textile mills.

This is one reason why **C-W** induction motors make good in this field.

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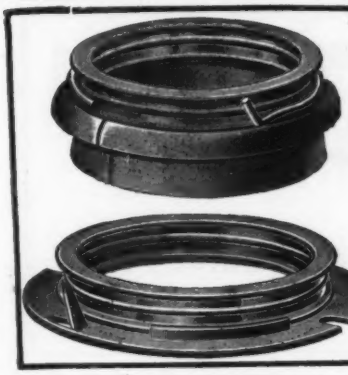

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THE ONLY
Seamless Hard Fibre
Roving Can.

The highest type of Roving Can ever produced.

Made from Pure Chemical Hard Fibre, without **seams** or **rivets**, absolutely smooth, and of incomparable durability.

Supplied with our Seamless Protection or Kicking Band, with either an electrically welded steel top ring, or a smooth turned fibre top, and with either a wooden or metal bottom secured with a seamless steel bottom ring.

Thousands of these "**No Waste**" Cans now in use and endorsed by the leading and most representative mills in the United States and Canada.

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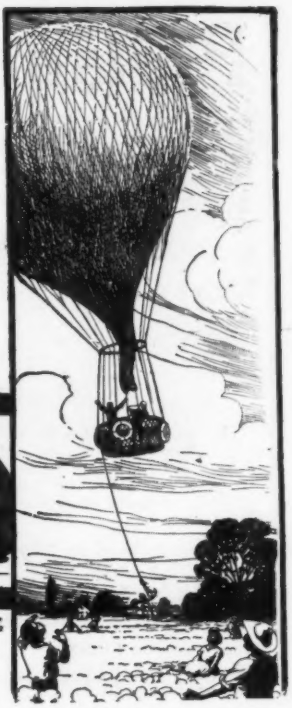
STANDARD FIBRE CO.
SOMERVILLE, MASS.

If you are using rope for baling you are helping to pay the gas bill to keep rope prices balloon high.

Rope is up—*Trojan Bale Tie* and *Band* is down.

Trojan Band is made plain or galvanized in coils from 2000 to 3000 feet without a break. Widths ½, ⅝, ¾ and 1 inch.

With the present high prices of rope Trojan Band and Buckle is a **money saver.**



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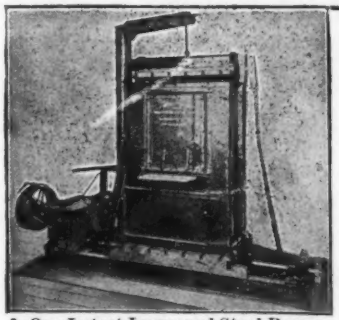
Brooklyn, N. Y.
Chicago, Ill.



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Minnich Baling Press

for all kinds of products.

Must turn out more bales with less labor and power than any press in the market.

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Oldest in America
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Cotton, Wool, Worsted and Silk

Instruction given in Designing, Weaving, Carding, Spinning, Chemistry, Dyeing and Finishing

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Sullivan Hand Baling Presses

may by run by one or two men. They make bales from 21x36 in. to 30x72 in.

Simple, durable and economical for packing waste.

Circular 159.

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Water Softeners

Filtration Engineers

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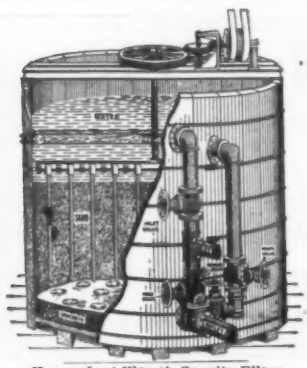

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FILTERS PRESSURE and GRAVITY

WATER SOFTENERS INTERMITTENT and CONTINUOUS

There is only one Filter, the

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Especially adapted for Cotton Mills. 25 to 33 per cent more Production Guaranteed. Weight Reduced 33 to 50 per cent. No Leather Covering Bill.

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OF ALL KINDS

For Laying Line, Twine and Cord of all sizes.

Nichols' Patent Whirligig Twister for Hard Laid Twine.
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Warp Yarn Twisters, Sail Twine Twisters.

Prices and particulars on application.

Soft Water

7,000 gallons per hour Softener installed for American Thread Co.

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E. E. BURNHAM, Pres. L. E. BARNES, Treas.

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85% Pure Magnesia Steam Pipe and Boiler Covering

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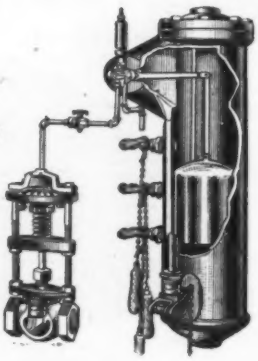

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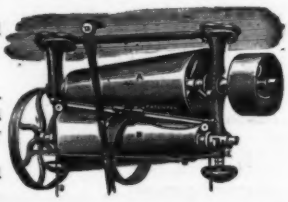
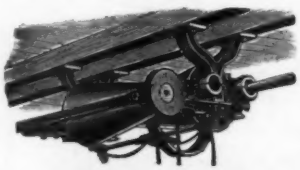
Variable Speed Countershafts

The Evans Friction Cone Pulleys



will drive your machines at any desired speed from 1 to 6 by simply pulling a cord. They are guaranteed to do your work.



We'll furnish them for either floor or hanging use.
Over Ten Thousand Sets in Operation in this Country and Europe.
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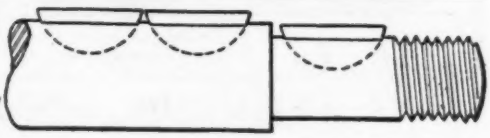
G. Frank Evans. - Newton Center, Mass.

Key Seating Attachment

FOR

Whiton Gear Cutter



We offer an attachment for use with our Gear Cutting Machine, to cut key seats for the Woodruff System of Keying. Write for description, circulars and price.

THE D. E. WHITON MACHINE CO.,
19 Oak Street, New London, Conn.

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WE ARE HEADQUARTERS

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CIRCLES, HACKELS, GILLS, FALLERS and PORCUPINES.
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Makers of Rag, Wool, Hair and Finishing Pickers, Automatic Square and Cone Willows, "Schofield" Intermediate Feed for Cards, Rag and Extract Dusters, Waste Pullers, Worsted and Shoddy Reels, All Kinds of Spike and Slat Aprons.

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Liberal Discount to Dealers.

MAILS

1866 1908

HARTFORD STEAM BOILER INSPECTION AND INSURANCE CO. HARTFORD, CONN

41st Annual Statement
January 1, 1908

Capital, $1,000,000.00
Surplus, 1,006,868.06
Reserves, 2,053,326.74
Assets, 4,060,194.80

The HARTFORD was the Pioneer Company in the field of Steam Boiler Insurance, and it is the only company which makes a specialty of and does exclusively a steam boiler inspection and insurance business.

The HARTFORD is the only company whose entire talent and energies are applied to the study of steam, to the scientific construction and installation of boilers, and to their periodical inspection by expert mechanics.

The HARTFORD is the only company whose entire assets and resources are held exclusively for the protection of steam users, and the payment of losses occasioned by the explosion of steam boilers and for no other hazard whatsoever.

The HARTFORD is now doing nearly nine-tenth of the Inspection and Insurance of Steam Boilers in the New England States, and nearly two-thirds of the entire amount done throughout the United States.

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Manufactured by
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MANUFACTURERS OF
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AND GENERAL MACHINERY
Specialties made of Renecking, Refluting, Filing and Honing of all kinds of Rolls. Flyers Repaired and Fitted with any desired style of Pressers, Spindles Straightened, Restepped and Retopped.
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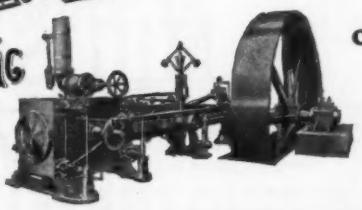
BUILT BY THE FISHKILL LANDING MACHINE CO.,
FISHKILL ON HUDSON N.Y.



For all power purposes
where high economy and
close regulation is required.

Cylinders & Valve Chests rebored in place.

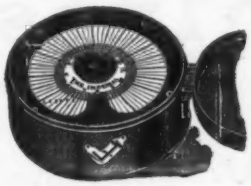
General engine repairs.

FOSTER SUPERHEATERS

Installed in any type of boiler without change in setting. Uniform superheat guaranteed.

Power Specialty Company,

BOSTON: 10 Post Office Square. NEW YORK: 111 Broadway.



WATCH YOUR WATCHMAN

The New Imperial Watchman's Clock

Compels your watchman to do his duty. This clock will reduce your insurance rate. No complicated mechanism. Absolutely reliable. Full particulars.

T. NANZ CLOCK CO., - - 127 Duane Street, New York.

Rubber Covered Rolls for all Mechanical Purposes

Special Densities for each purpose giving results not obtainable elsewhere.

Rubber Covered Slasher Rolls

Also Power Wringers of all sizes and descriptions.

Old Rolls Recovered. New Rolls Complete.

The American Wringer Co., 99 Chambers Street, New York City.

Factory, Woonsocket, R. I.

Thread and Silk **SPOOLS** of any description

made from one piece, up to 6" long and 3" dia.

We are located in the best white birch region. Our work and prices seem to satisfy the most particular customers. We can give any finish desired. Estimates furnished on samples submitted.

E. L. TEBBETS & CO., Locke's Mills, Me.

SAVE
Their Cost
In Freight.

THE CHAFFEE PATENT CLOTH BOARD,
Made of paper and wood,
Needs no covers.
Will not split or warp;
Not liable to break.

MFG. BY CHAFFEE BROTHERS COMPANY, OXFORD, MASS.

BOX SHOOKS and CLOTH BOARDS.

Clean
LIGHT
Strong

ANYTHING

Entire Outfits for New Mills, or small and odd items that you don't know just where to obtain, can be found at the

AMERICAN SUPPLY CO.,
PROVIDENCE, R. I.

in Mill Supplies.

Shaw's "Victor" Travelers

Manufactured by

VICTOR SHAW RING TRAVELER CO.

Incorporated 1899.

23 Sabin Street, PROVIDENCE, R. I.

ASHWORTH BROS.,

—MANUFACTURERS OF—

Card Clothing of Every Description

FALL RIVER, MASS.

Cutting Machines

Every Textile Manufacturer has his own special problem. If these problems relate to CLOTH CUTTING in any way, shape or form we are always glad to volunteer our help in solving them.

61 Poplar Street
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Cameron Machine Co.

Special Textile Machine Designers

Telephone 989-3.

W. U. Code Word—Adamsal

A. L. ADAMS,

MANUFACTURER OF PATENTED

CORSET AND FABRIC MACHINERY.

Strip Cutting, Folding and Winding Machines, Plain or Bias, 300 to 2400 Yards a Minute.

I personally, have introduced and taught people to do bias on my machines in seven countries. I furnish a complete equipment for cutting straight or bias fabric, and folding same.
Automatic Strip Cutting, Folding and Winding Machines in three variations. Universal Folding, Winding and Spooling Machines in three variations. 40-inch Winding and Cutting Machines. All of the seven machines for straight or bias fabric.
These machines pay for themselves in a short time. Any kind of a folder for any kind of fabric, bias or straight, 1-8 to 6 inch,

151 MIDDLE STREET, BRIDGEPORT, CONN.

Oils

Sewing Machine Belting, Press Boards, Belt Hooks, Lace Leather, Leather Belting, Latch Needles, Oilers of every description, Mill Baskets and Brooms, Mill Banding, Rings and Springs, Packings of all kinds, Fire Pails, Shears and Trimmers, Cloth Knives, Etc.

E. W. Murphey & Co.

HUDSON, N. Y.
Established 1831.

and Mill Supplies

BALE-TIES and BUCKLES
BOX STRAPPING ALL STYLES

Samples and prices on application.

ACME STEEL GOODS CO.

Name changed from Acme Flexible Clasp Co.

NEW YORK, 28 Elm St. CHICAGO, 2832-40 Archer Ave.
ATLANTA, GA., Empire Bldg.

1000 Gallons of Soft, Pure Water

20 Barrels for Two Cents

for 2c.

That is the average cost of making hard water soft with the

Dodge Automatic

"EUREKA"

Water Softener and Purifier.

for 2c.

For the price of a postage stamp you secure 1000 gallons of a water that will produce

Level Dyeing.

The wool is *clean* because it has been scoured and washed in water that is free from impurities that adhere to the wool, consequently the coloring matter can penetrate and affix itself in *every* portion of *every* fibre, and no *spots* or *streaks* mar the appearance of the finished piece.

Consider the SOAP SAVING—it amounts to the difference between the soap required to produce "suds" on your *hard* water as against practically a RAIN water.

It is not necessary to "doctor" our treated water.

We can CLARIFY your turbid river or lake water. By using the treated water in your boilers, as well as in the manufacturing processes, you prevent scale and all of its attendant evils and expenses.

A postal card request will bring you our interesting book "No. 414" which tells all about the "Eureka" System.

Dodge Manufacturing Co., Mishawaka, Ind.

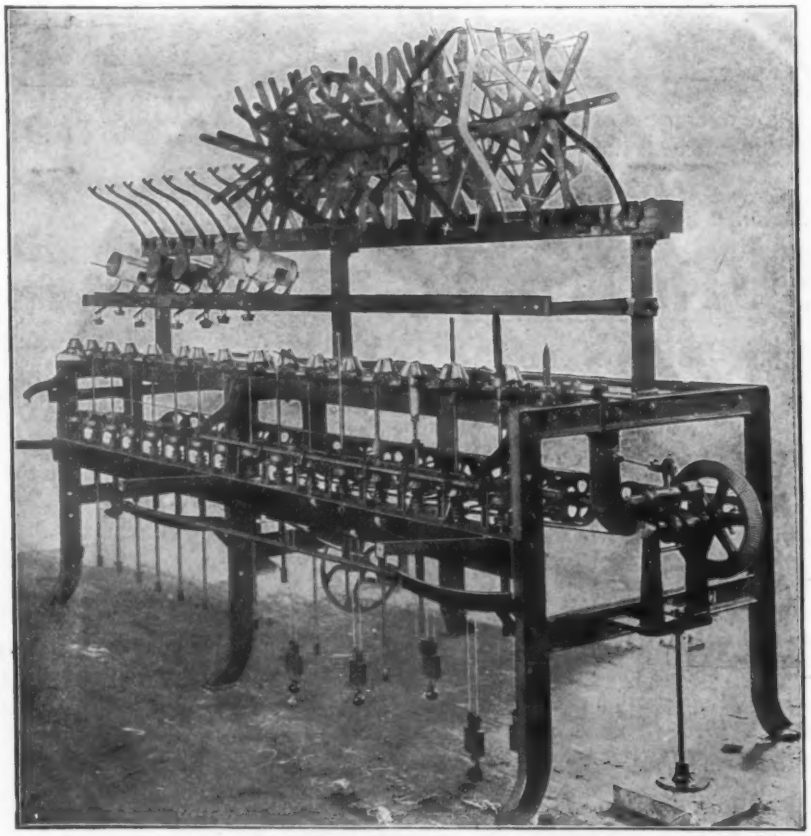
P. S.—These are some of our textile mill customers:—

South Bend (Ind.) Woolen Co.
Cooper, Wells & Co., St. Joseph, Mich.
Burson Knitting Co., Rockford, Ill.
Kalamazoo Knitting Co., Milwaukee, Wis.
Des Moines, (Ia.) Hosiery Mills.
Ipava (Ill.) Woolen Mills.
Clinton (Mich.) Woolen Mfg. Co.
Wayne Knitting Mills, Fort Wayne, Ind.

Oswald Lever Co.

(Formerly Lever & Grundy)

Lehigh Ave. and Mascher Sts., PHILADELPHIA, PA.



High Speed Cross Quiller.

(See opposite page.)

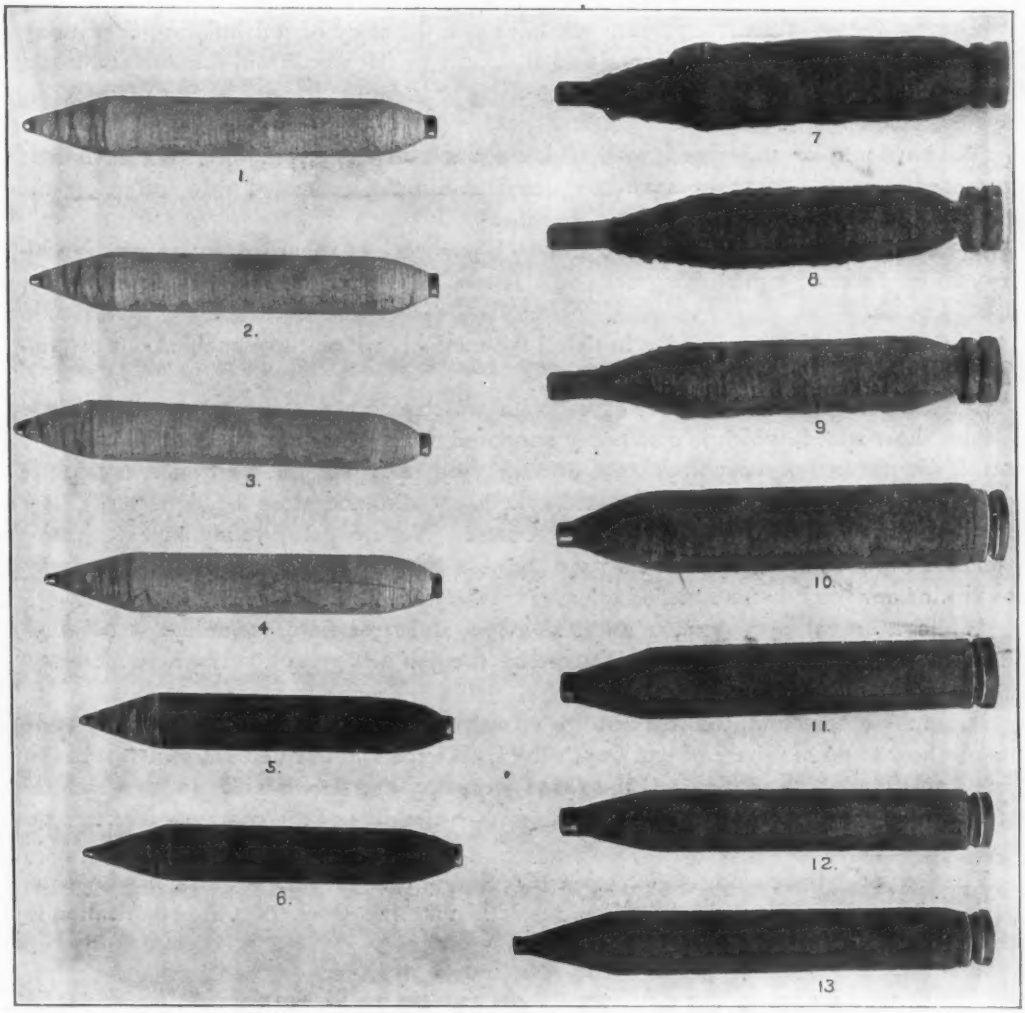
This machine which has just been put on the market and which was illustrated in the April issue, is an improved cross traverse quilling machine to wind from skeins, spools or mule cops on to quills or paper tubes. It is built to run from 1,800 to 2,400 revolutions per minute.

The cops shown on opposite page, excepting Nos. 7, 8 and 9 were wound on this machine.

Oswald Lever Co.

(Formerly Lever & Grundy)

Lehigh Ave. and Mascher Sts., PHILADELPHIA, PA.



The above cuts are wound on the High Speed Cross Traverse Quiller shown on opposite page. These can be made to make cops up to 9 inches Long and 1 1-4 in. Diameter.

No. 1 Cut shows a cop of 1/40 Bleached Cotton Yarn wound from skein on to paper tube 7 inches long and 1 inch in diameter.
No. 2 Is 1/36 Bleached Cotton from Skein.
No. 3 Is 1/30 Bleached Wound From Skein.
No. 4 Is 1/25 " " " "
No. 5 Is 1/36 Black Dyed In Skein Wound Direct on to Paper Tube, 5 1/2" Long and 3/8" Diameter.
No. 6 Is 1/25 Wound from Skein Black Cotton.
Nos. 7, 8 and 9 Shows Worsted Yarn Wound on Mule Bobbins.
No. 10 shows the three Mule Bobbins wound on to one Shuttle Bobbin of same length and diameter.
No. 11 1/12 Wound from skein on to Ring Bobbin.
Nos. 12 and 13 Is 2/16 On Different shuttle bobbins Wound From Skeins.

THE SYSTEM UNDER WHICH THE GILBRETH ORGANIZATION OPERATES

During the past fourteen years we have told the story of our building operations. These operations extend from Canada to the Gulf of Mexico, from the Atlantic to the Pacific Coast. They range from 1900 feet dams to gigantic mauufacturing plants, from office buildings to entire towns.

We have told of the speed with which our work was carried out. We have cited contract after contract that we have completed within the estimated time and below the estimated cost—to the owner's financial benefit.

We have shown the satisfaction with which our work is regarded by owners, architects and engineers by publishing facsimile letters. We pictured the progress of jobs, week by week.

We are now going to describe in detail the methods which have enabled our organization to accomplish these results.

We are going to show how the speed with which our work is performed is made possible; how speed, which is commonly supposed to increase the cost of a contract, is secured without loss of economy to the owner; why quality is not sacrificed to speed; how we are able to carry on work located at a great distance from headquarters; how we train our men; how we keep our accounts. We are going to lay bare our entire scheme of work, in order to show how we are able to attain our success and why ninety per cent. of our work is for satisfied clients for whom we have previously done work.

While a crowd of workmen may, if given sufficient time, complete a building operation—with or without system—the cost of the job will very likely prove most unsatisfactory to the owner.

If, on the other hand, the work of this crowd is systematized; if each member of it is taught how to do his share of work with the least expenditure of effort, and within the shortest possible length of time; if the speed, economy and dependability with which he performs his work are recorded and rewarded, then the date of the completion of the job becomes a certainty to the owner.

These are the lines along which our entire force of employees—from office boys to superintendents—has been trained. The result is that the work of our organization is almost automatic.

FRANK B. GILBRETH

GENERAL CONTRACTOR
FOR ARCHITECTURAL AND ENGINEERING CONSTRUCTION

EASTERN OFFICE
34 W. 26TH ST.
NEW YORK

WESTERN OFFICE
ST. CLAIR BUILDING
SAN FRANCISCO

THE SYSTEM UNDER WHICH THE GILBRETH ORGANIZATION OPERATES

When a contract is awarded us, it is divided into sections. Each section is assigned to its proper department.

1. The Methods Department determines upon the scheme of operation.
2. The Estimating Department figures the cost of material.
3. The Purchasing Department—the cheapest market.
4. The Routing Department—the quickest way of shipping the materials to the job.
5. The Accounting Department checks the accounts and receipt of materials.
6. The Cost Department analyzes costs to date and what will have to be spent to complete the job.

Each department has its individual system, which governs its working implicitly. Suggestions toward improving the systems are at all times encouraged, by means of cash rewards.

Daily reports to headquarters keep us informed of the itemized progress of the work. Every Saturday the owner receives a detailed statement showing the cost of the work completed and the estimated cost of the part which is still to be done. As we take contracts only on the cost-plus-a-fixed-sum basis, he knows exactly what our profit is to be, and that every saving we can effect—and there are many on every job—goes into his pocket. (*See "Different Plans of Letting Contracts," Engineering News, Oct. 18, 1906, pp. 411.*)

The series of advertisements to follow will explain our methods in detail, will quote from our systems, and will show the report forms which enable us to keep in touch with everything pertaining to each job. They will show every step in a typical job, from the time we receive the contract until it is completed.

This series of advertisements will furnish a logical explanation of the causes responsible for the success of our organization in handling works of magnitude where speed is of the essence of the contract, regardless of the distance from our main office.

FRANK B. GILBRETH

GENERAL CONTRACTOR
FOR ARCHITECTURAL AND ENGINEERING CONSTRUCTION

EASTERN OFFICE
34 W. 26TH ST.
NEW YORK

WESTERN OFFICE
ST. CLAIR BUILDING
SAN FRANCISCO

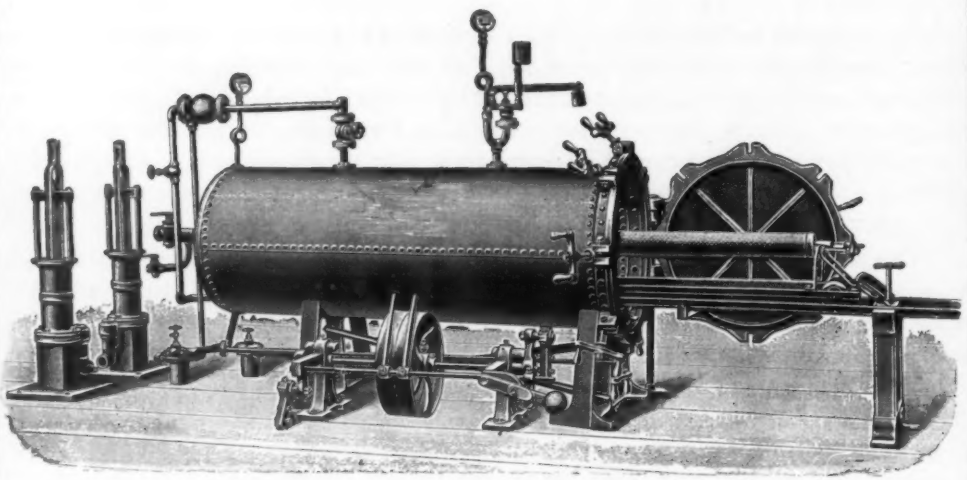
Cockled Cloth Positively Prevented

and a

Permanent Stainless Lustre Secured

by using this

MACHINE



Write for particulars

L. H. A. Schwartz & Co., 141 Milk Street, Boston

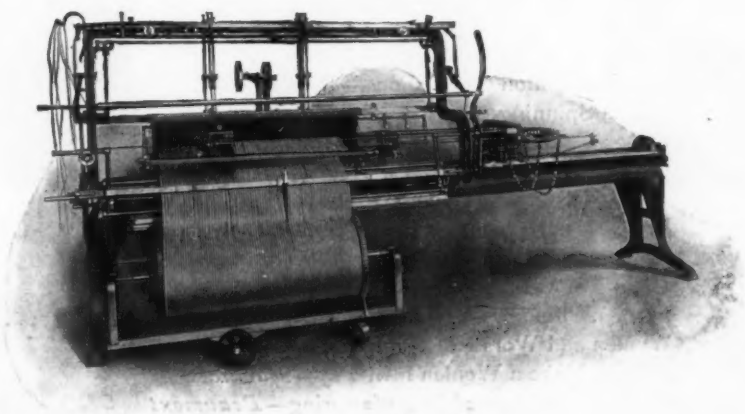
American Agents

Built by Paul Klug Machine Works, Crimmitschau, Saxony

Automatic Warp Drawing Machines

They are a long stride toward

Economy in Drawing-in **Better Weaving**
Greater Production **Less Loom Stoppage** **Less Help**
Less Room **Less Delay** **Less Trouble**



They Handle *The Entire* Drawing-in and

Entirely Eliminate the Old Hand Process

40,000 to 130,000 *Ends per day according to* nature of work

New Types of Machines Now Handle

Work in cotton harness up to 120 inches wide
Draper Steel Harness
Cotton Harness and Warp Stop Motion Bars

American Warp-Drawing Machine Co.

289 A Street, Boston, Mass.

Textile Books
for progressive men

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Weaving, Plain and Fancy—*Nelson*	1.25
Practical Cotton Calculations—*Whitworth*	1.25
Cotton Spinning (3 vols.)—*Taggart*	7.50
Cotton Combing Machines—*Thornley*	3.00
Cone Drawing—*Buckley*	.50
Worsted Overseers' Handbook—*Buckley*	.50
Principles of Wool Combing—*Priestman*	1.50
Principles of Worsted Spinning—*Priestman*	2.50
History of Wool and Wool Combing—*Burnley*	6.00
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Practical Carder (Cotton)—*Greer*	1.00
Manual of Weave Construction—*Kastanek*	1.00

All books sent prepaid on receipt of price

New Catalogue of Textile Books, covering all lines, mailed free on application.

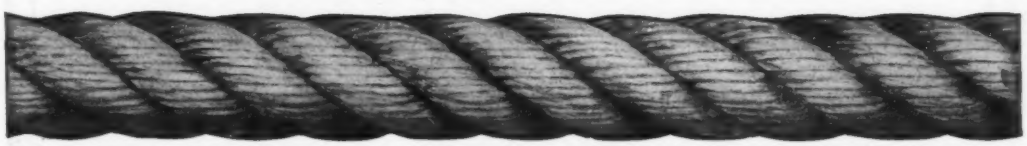
Lord & Nagle Co., Publishers,
Boston.

The value of a rope is measured by the amount of work you get out of every dollar's worth. Value is the ratio of cost and durability in service.

"American" Transmission Rope is not the cheapest rope made, but it is the cheapest in the end. You can get more work out of every dollar invested in "American" Transmission Rope than any other known brand in the world. Furthermore, we are prepared to demonstrate this fact to all who are interested.

Write for our
"Blue Book of Rope Transmission."

The
American Manufacturing
Company
65 Wall St., New York City
Boston office: Ames Building



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CARL PICKHARDT, 1st Vice-President
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TEXTILE WORLD RECORD

Published on the 12th of each month by

LORD & NAGLE COMPANY

FRANK L. NAGLE, President. **HENRY G. LORD, Treasurer.**

SAMUEL S. DALE, Editor.

Publication and Editorial Office

144 Congress Street, Boston.

119 South 4th Street, Philadelphia. **123 Liberty Street, New York.**
463 East 42nd Street, Chicago.

Entered at the Boston Post Office as Second Class Mail Matter.

Subscription Rates.

Textile World Record in United States and Mexico	$2.00 per year
To **Canada**, on account of extra postage	$2.50 per year
To other **Foreign Countries** (postage paid)	$3.00 per year
Textile World Record and the **Official American Textile Directory**, (Traveler's Edition),	$3.00 per year
To **Foreign Countries** with Directory (postage paid)	$4.00 per year
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Remit by Express Order, Postal Money Order, Cheque or Registered Letter to Boston Office.

Copy for regular advertisements must reach publication office by the 25th of month preceding date of issue to insure proper attention. Transient ads., Wants, For Sale, etc., to go on Classified pages can be taken up to the 4th of the month of publication. We are always pleased to co-operate with advertisers in preparing attractive advertisements, and strongly recommend frequent change of copy, which increases the interest, and, therefore, the beneficial results of the advertising. We will cheerfully change copy as often as may be desired, providing it reaches us in time, but we cannot promise changes for next issue unless received as above stated.

Advertising rates on application.

Official American Textile Directory

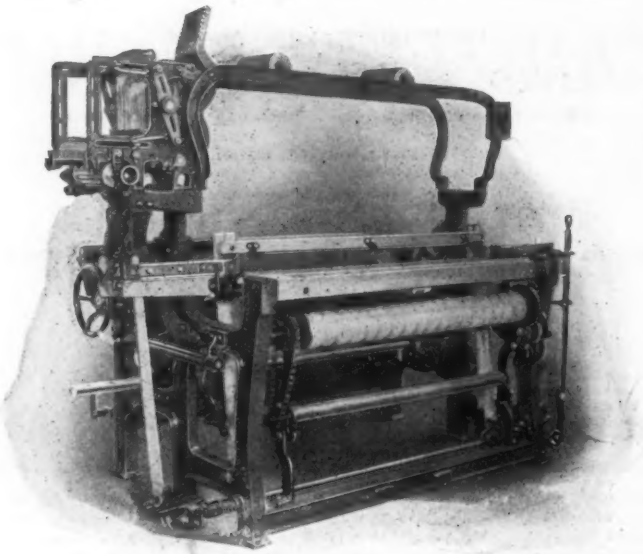
Published annually, in two editions. Office, Large Size, **$3.00. Travelers'.** Flexible, Smaller, **$2.00.**

A Complete Directory of Cotton, Woolen, Knitting, Silk, Flax and Jute Mills of the United States, Canada and Mexico, together with the Dyeing and Finishing Works, Bleacheries, Print Works and other Textile Establishments; about 7,000 in all. Full information is given about each mill in almost every instance, viz., the name of the company or firm, names of officers, agent, superintendent, the character of goods made, the machinery equipment, i. e., the number of sets of cards (or combs), the number of spindles, number of looms; whether the mill uses steam or water power, whether there is a dye house or not, the names of the selling agents or if the mill sells direct. All this and much other information contained in this book is arranged in a way to be instantly accessible.

American Directory of the Knitting Trade.

Published Annually in a handy size for the pocket, $1.00.

It contains **full reports of every knitting mill** in the United States and Canada, giving capitalization, names of the officers, including superintendent and buyer; kind of goods made; number of knitting machines, whether latch **or** spring needle; number of sewing machines; whether the mill dyes or bleaches or finishes; kind of power; number employed; selling agent; kind of yarn bought; lists of the jobbers, manufacturers' selling agents, commission merchants, department stores and large retailers handling knit goods and the name of the person in charge of the knit goods department. List of dyers, bleachers, finishers, printers, etc., making a specialty of knit goods work. Special copyrighted maps of the mill districts, showing the cities and towns where there are knitting mills. It is indexed so any town or mill may be quickly found.



A Dobby Cotton Loom

for fine or coarse fancy cottons—designed for high speed—extra rigid frame, built at our Providence Works. A special feature is the high roll take up, which allows the winding of a large roll of goods.

We solicit inquiries regarding this type or any of our various looms for cottons, woolens, silks or special fabrics.

Crompton & Knowles Loom Works

Worcester Providence Philadelphia

Table of Contents for May.

	PAGE
Monthly Comment	67
Seasonable Fabrics	78
Style Suggestions for Woolen Manufacturers	80
The New Lawrence Textile School	81
Washington Notes	86
Air Conditioning	88
Hosiery and Knit Goods Manufacturers' Conventions	90
The National Association of Cotton Manufacturers	96
CORRESPONDENCE AND NOTES	122
The Dressing Room—English Notes—Estimating Cost of Woolen Goods—Humidity in Textile Mills.	
QUESTIONS AND ANSWERS	134
KNITTING DEPARTMENT	138
Knit Situation—Braid Manufacture—The New 20th Century Double Acting Ribber—A Brake for Knitting Machines—Mill News.	
NEW MACHINERY AND PROCESSES	150
DYEING, BLEACHING, PRINTING, ETC.	166
MILL NEWS	176
PERSONALS	182
INDUSTRIAL NOTES	187
RECENT TEXTILE PATENTS	196
WOOL MARKET	225
COTTON MARKET	227
YARN MARKET	229
RAG AND SHODDY MARKET	238
DYESTUFFS AND CHEMICALS	240

Textile and Technical Books.

We sell all textile books at publishers' prices. We publish technical books, especially on textile subjects, and make liberal arrangements with authors.

Correspondence.

We solicit correspondence on textile subjects. Articles accepted will be paid for. Name and address must always be given, not necessarily for publication. Subscribers are invited to make free use of our Questions and Answers Department; correspondence is strictly confidential.

HOWARD & BULLOUGH,

AMERICAN MACHINE COMPANY, LTD.

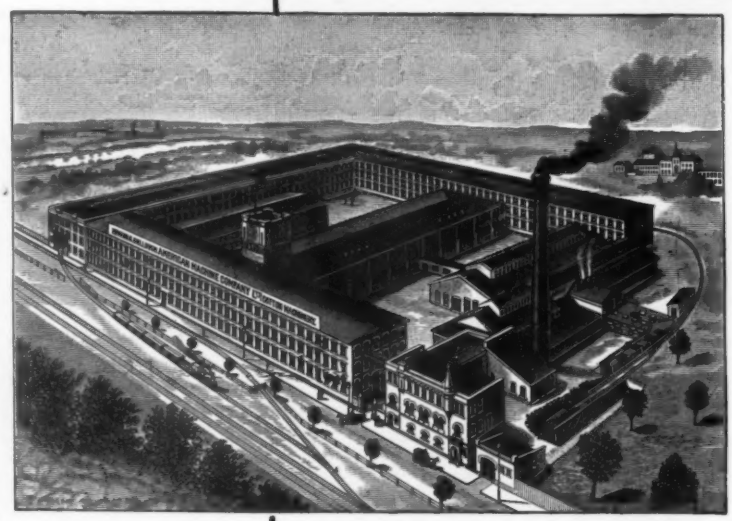
PAWTUCKET, R. I.

C. E. RILEY, Treas.
Boston Office, 65 Franklin St.

Southern Office
814-815 Empire Bldg., Atlanta, Ga.

COTTON MACHINERY

WE INVITE YOUR INVESTIGATION AND COMPARISON



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Openers

Breaker Lappers

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TEXTILE WORLD RECORD

COMBINING

The Textile World and Textile Record.

VOL. 35 (NEW SERIES.) May, 1908 No. 2

Monthly Comment.

Wider Markets for American Mills.

April 13, 1908.

Editor Textile World Record:

With interest I read your article in the April edition on "Wider Markets for American Textile Mills," and in answer beg to suggest that I believe you could have saved a lot of space in your periodical if you had not printed the article. I am talking from experience if I say that, as a class, the American manufacturer is not ripe to do an export trade.

I do not want to let loose a long tirade, but as long as our manufacturers will insist upon "cash before delivery," or "cash must accompany the order," they will have a slim chance to compete with European manufacturers. Our people are not afraid to sell to Tom, Dick or Harry on long terms as long as he lives in Oshkosh or any other place in the United States, but if he happens to have his business in Mexico or South America they would not give credit if he had millions invested.

I suppose you know how lax our laws are in comparison to those very strict ones in Latin American countries. If a man goes under in our country, and the records do not show an honest failure, he generally starts up again in a short while under his wife's or son's name, or some other relative's. He would not dare to do this in South America; in fact he could not, as the laws would put him into prison as long as his affairs are not cleared. I could go into detail about this and give you facts to show that there are houses in Buenos Ayres that can compare very favorably with our New York, Boston and Chicago houses, but which give their orders to England, France and Germany, not because they sell cheaper, but because they are up to date.

I know at least three large manufacturers of textiles in the United States who could put on this shoe, as it would fit them fine. Also other branches, as wall paper, tools, machinery, I could name you.

Furthermore an American manufacturer wants to sell what he makes and would not change a fabric to suit another country under any circumstances. For example, a Mexican house tells a salesman of an American house: "I like your cloth, but under our tariff laws it would cost 10 per cent. more duty than if it had two ends less per inch each way, warp and filling." The salesman will report this to his house, but the mill generally refuses to make a "Special" fabric and says: "If he cannot use what we make we are not going into changes for him." I had this a few years ago; it happened to me indirectly.

The only stuff we can sell in other countries is raw materials which command cash in all countries, or such articles as we can dump at ridiculous prices. I can buy American typewriters in Europe 50 per cent. cheaper than in New York. In plain words, our tariff prevents competition by foreign manufacturers of typewriters. We have to pay $100 for the same article which is sold in England for $50. If your representative will call on me at New York I will put him wise, and you can either print the interview or communicate it to leading manufacturers.

I would be only too happy if you could show me that our people have changed in the last three years.

Fred Sternberg.

We welcome Mr. Sternberg's letter in which he seeks to show that we are wrong, the more because he "speaks from experience." Having branches at Bradford, Manchester and Bolton, England, and at Hamburg, Germany, he speaks from experience in the foreign as well as the American market. It seems to us, however, that he fails completely to meet the main contention in

"Wider Markets for American Textile Mills," that the chief difficulty in selling American textile goods in foreign countries is the higher manufacturing cost, due principally to higher wages in the United States.

We might agree with Mr. Sternberg's statements that a lot of space could have been saved by not printing the April article; that American exporters are less willing to give credit to foreign customers than foreign exporters are; that American merchants are too easy about extending credit to domestic customers; that the American manufacturer is disposed to refuse orders for "specials"; that our export trade consists largely of crude materials; that American typewriters are dumped on foreign markets; and that the tariff is responsible for this dumping. We do not agree with all these statements, but we might do so without affecting in the slightest degree our claim that the chief difficulty in making American textile goods at a profit for the export trade is found in the higher wages paid in American mills. To this Mr. Sternberg makes no reference whatever. Are we right or wrong? If wrong give us the proof. While waiting for his answer let us examine some of the minor points he has raised.

First as to credits. We have no knowledge of the comparative merits of American and Latin-American bankruptcy laws. The superiority that Mr. Sternberg claims for the latter would of course facilitate the development of trade with Latin-America, but until American textile manufacturers have learned of this superiority by experience their insistence on cash terms with unknown buyers in distant countries is natural and justifiable.

Now as to the unwillingness of American manufacturers to make "specials." One of the features of American industry, textile and otherwise, is the standardizing of finished products. This has been an important means of keeping the cost per unit of production down while wages were kept up. Every practical manufacturer knows that a large number of fabrics and styles means reduced production and increased cost. Accordingly he seeks to keep each mill on as few kinds of goods as possible. One of the great advantages possessed by the American Woolen Co. is the ability to assign each mill to the manufacture of one class of goods.

This explains why the American manufacturer refuses to accept small orders for goods varying from the regular products of the mill. It undoubtedly is exasperating for Mr. Sternberg or any other salesman to secure by hard work an order for a special fabric and then have it declined abruptly by the manufacturer. It is even more exasperating for a textile manufacturer to have his production reduced, his cost increased, his goods damaged by mix-ups and other mistakes, his mill filled with a lot of special machinery, while the operatives are puttering away on special fabrics for special customers, who may finally leave a lot of unmerchantable goods on the manufacturer's hands by refusing to accept them when delivered. It is because of the losses from such a method of doing business that American textile manufacturers generally refuse to accept orders for small lots of specials. Foreign mills may be hitched up to do this kind of business, but American mills cannot do it at a profit without a revolution in methods of manufacturing and marketing.

A reference to dumping, in another part of this issue, will serve as a comment on Mr. Sternberg's complaint on this score.

We have now covered the points raised by Mr. Sternberg. They illustrate a too common habit of finding fault with the methods of American manufacturers without giving any good reasons. The American textile manufacturer does not lack intelligence; he is not unreasonably obstinate; he is not grossly ignorant of his own business; he is not a whit inferior in intelligence and training to his foreign competitors. Each, American and foreigner, is doing his best to solve the particular industrial and commercial problems with which he is confronted. Many American manufacturers were once foreigners, and they are as stubborn in their conformance to American methods as the natives are.

General fault finding with our manufacturers is worse than useless; it obstructs the search for the best means for restoring prosperity in American mills. We must have other evidence besides that given by Mr.

Sternberg before we can change our opinion that the best way of promoting this prosperity is thorough-going protection of the home market by adequate duties on imported goods, and strict enforcement of the Customs Administrative Act.

The Compulsory Working of Patents.

Our Washington correspondent gives an interesting summary of the situation as affecting the proposed patent legislation to annul patents when the patented articles or processes are manufactured or worked exclusively or mainly abroad and the American patents are used simply to prevent the use of the inventions in the United States.

It is unfortunate that, as now seems probable, action on this important question must be delayed. The end of the session is near at hand, and the members of both branches of Congress are too much interested in retaining their seats to give this patent question the careful consideration that should precede legislation of any kind.

Public sentiment in favor of legislation is, however, likely to grow rapidly during the next six months and force prompt action by Congress at the short session next winter. The only danger in delay lies in possible action in the meantime by the administration in the form of a one-sided patent agreement with foreign countries. Alarmed at the prospect of retaliation and possibly encouraged by her success in negotiating the tariff agreement of last year, Germany is already seeking a patent agreement with this country, as the following press despatch from Berlin shows:

> Berlin, April 28.—It is understood here that the German Government has taken the preliminary steps to negotiate a patent agreement with the United States. This action is in consequence of the prospect of federal legislation requiring foreign patentees to manufacture in the United States, otherwise their patents will be forfeited. The German law provides for forfeiture in the event of a patent remaining unused for three years and if a German subject makes application to have it set aside.
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> The law covering patents recently passed in England has created considerable commotion among the German chemical companies who sell on the English market. A number of these companies have decided to increase their capitalization in order to erect factories in England.

When forming and carrying out his blood and iron plan to unify the old German states into an imperial Germany it was Bismarck's first idea to have no patent laws at all in Germany. He believed that by giving German manufacturers free use of the inventions of all countries they would be greatly aided in developing the industrial possibilities of the new German nation. Later he was persuaded to modify this idea, but the principle was retained in the section of the German patent law which provided that a German patent could be summarily annulled if the invention was not worked in Germany within three years. This shrewd provision has probably been more effective than the original no patent policy would have been. Under it German industry has advanced by leaps and bounds during the past forty years. During all this time Great Britain and the United States have granted patents to all comers regardless of whether the inventions were worked in these countries or not. Thus the patent laws of the three nations combined to protect the German industry and discourage manufacturing in the two English speaking countries.

This absurdly unfair arrangement would probably have continued indefinitely had it not been for the awakening of public opinion in England, chiefly as a result of the phenomenal development of the artificial color industry in Germany and its decline in the United Kingdom. The Textile World Record has for years repeatedly called attention to the patent situation and urged the application of the obvious remedy. Recent developments give additional force to the following extract from our issue of November, 1906:

> The reason why Germany reaped this great industrial advantage resulting from the discovery of mauve was not, as was stated by President Pritchett of the Massachusetts Institute of Technology at the Boston banquet to Dr. Perkin, "because Germany realized the importance of this development and had schools and men to take advantage of the discovery." Dr. Perkin realized this importance as did Englishmen and Americans generally. Moreover both England and America have the "schools and the men." President Pritchett should be the last to deny either proposition. We have had and still have all the facilities that President Pritchett thinks are essential to success in the manufacture of coal tar colors, but they have not prevented the industry that Dr. Perkin founded in England from leaving England and flourishing

in Germany. Neither have they made it possible for the coal tar color industry to reach more than a trifling development in America. What, then, is the reason for this failure in English-speaking countries and the phenomenal success in Germany? It is to be found in the protection given to the German industry by the patent laws not only of Germany, but also of Great Britain and the United States. The following comparison of the patent laws of these countries, taken from the Textile World of February, 1902, discloses at a glance the reason that President Pritchett has so strangely overlooked:

PATENT LAWS.

"Germany. Requirements: Annual (yearly increasing) tax. Invention must be worked within three years from the date of the patent.

"Great Britain. Requirements: Annual (yearly increasing) tax to maintain validity. No working of inventions required.

"United States. Conditions of Grant: Unlike most other countries, the United States grant extends exclusive privileges to the inventor without restrictions of any nature. No annual or other taxes are required, and the invention is not required to be worked."

It is this protection afforded the inhabitants of Germany by German, English and American patent laws that in fifty years has forced Great Britain and America to pay tribute to Germany for the products of the industry founded by Sir William Henry Perkin.

We are not claiming any especial credit for arousing public opinion. We are simply improving a good opportunity of saying, "I told you so." Our voice would have continued as that of one crying in the wilderness if Great Britain had not set the example for the United States by amending her patent law so as to provide for the compulsory working of patented inventions. Our readers are familiar with the object lesson presented during the past four months by foreign (including American) manufacturers hastening to establish works in England to protect their British patents. The industries thus transferred to British soil, which were large enough to warrant the establishment of separate works, do not tell the whole story. There are many patented inventions whose owners have been forced to grant licenses for working in Great Britain, and which represent in the aggregate an increase in British industry that may exceed that resulting from the establishment of separate works.

It is this great international object lesson that has aroused public opinion in the United States to the importance of following the British example. The value of a patent is in proportion to the actual and prospective value of the market in which protection is granted. For that reason Germany or Great Britain would be injured far more by a compulsory working clause in the patent laws of the United States than we have been or are likely to be injured by a like provision in the German or British statutes.

Let us have fair play in international patents without unnecessary delay. Above all things let there be no counterpart of the German tariff agreement in our patent relations with foreign countries.

Dumping.

Selling goods to foreign buyers for less than the domestic buyer is required to pay is so common throughout the world that it seems as if it were the result of a general law of trade. We are informed on good authority that American steel and food products are sold abroad for less than the price charged in the United States. In our March issue we presented evidence of the sale of German worsted dress goods for export at less than cost. Canada has found the dumping of foreign products so demoralizing to her industries that she has imposed penalties designed to prevent the practice.

The following letter to the Manchester Guardian gives the experience of an English manufacturer of drying and ventilating apparatus, which found that the English firms from which he bought goods were ready to sell for export at a discount 16 1/2 per cent. greater than he could obtain in England:

Sir: In connection with some contracts abroad we wanted certain goods which are only made by a limited number of English firms. They all use the same price list and quoted us a discount of 58 1/2 per cent. off this list delivered at the foreign port where we wanted them. Not being satisfied, we asked our representative abroad to write to the same English firms for prices, and they quoted him 75 per cent. off the same list for the same goods and the same delivery.

If this is not preference for the foreigner we should like to know what is.

Yours, etc.,

J. D. Sutcliffe, Managing Director, Sutcliffe Ventilating and Drying Co., Ltd.

Manchester, March 21.

When attacks are made on a protective tariff because manufacturers sell for export at prices below those charged at home, it is well to bear in mind the above and similar cases that show the prevalence of this practice in other countries. Dumping may be, as we think it is, wrong and an injury to both the dumper and the dumpee, but it is not an argument against a protective tariff. It is an evil that calls for some other remedy than one that would destroy our home industry. That remedy, as we have seen, is sought by both free trade England and this country of high protection.

English Spinners Not to Grow Cotton in the United States.

The English spinners have definitely decided not to purchase and manage a cotton plantation in the United States. This decision was announced at a recent meeting of the Cotton Buying Co., of England, by Thomas Coates, one of the members of the committee having the matter in charge. Following is the published account of Mr. Coates' explanation:

Mr. Thomas Coates, who presided at a meeting of the Cotton-buying Company held at Oldham on Saturday evening, introduced the subject, and said they agreed to take up 500 shares in the plantation. He was one of the seven who signed the circular convening the meeting, and was appointed one of the Committee. Everything, he said, looked favorable until one of the gentlemen raised the question of the legal position of foreigners holding land in America. He thought he could not better explain the matter than by reading the opinion of the solicitor who had acted on behalf of the Committee. It was from Mr. Williamson, of the firm of Messrs. Slater, Heelis, Williamson & Co., solicitors, Manchester, and the letter was addressed to Mr. C. W. Macara. Writing on behalf of the firm, Mr. Williamson stated: —

"We write to confirm the advice which we gave verbally at the meeting, that the proposed formation of a company to purchase the Heathman Plantation, in Mississippi, should be abandoned.

"The various opinions of American lawyers, which have been before us, as to the capacity of a company to acquire land in the way proposed and the extent of land which it might hold, and the responsibilities of the directors and the methods and conditions of business as regards residence of persons interested and places of meeting, and other matters, and the perusal of various sections of statutes of the State of Mississippi. have led us to the conclusion that the statutes of that State are somewhat loosely worded and that there is divergence of opinion on the part of American lawyers on points of importance which have been actually before us, and that there may be divergence of opinion upon other matters which have not at present arisen for consideration, but which might arise hereafter.

"Signs of disapproval in America of your proposed scheme have, we think, already shown themselves, and the nature and purpose of the scheme is one which can hardly fail to attract attention and possibly opposition there. Your company would probably have enemies — possibly a good many enemies — on the spot, who would be on the lookout for opportunities of worrying it and hampering it, and perhaps forcing it into litigation on all sorts of trivial technicalities; and with the knowledge of this probability, the element of uncertainty as to Mississippi law, becomes a serious one.

"We much regret to have to give this advice, as the purpose of the scheme was an excellent one, and you and your friends have taken so much trouble with reference to it.

"We would remind you that Mississippi is one of the States which we in the first instance ruled off as undesirable, on the ground that it presented great technical difficulties, and that there are other States in which the legal situation appears to be much simpler. We only afterwards returned to Mississippi on account of the very favorable views which were entertained of the Heathman estate. Is there no possibility of the scheme being carried out in some other State in which you are not so hampered?"

The Chairman added that during their discussion on the matter it was stated that not only the firm in America, but every director also, would be responsible to the extent of the whole of his estate in the case of legal proceedings. Under the circumstances they did not think it advisable to go into the scheme. Another proposal was to form a company in England, with a subsidiary company in America, and although they were disposed to go into cotton-growing in America, the unanimous opinion was that they had better abandon the scheme.—(Hear, hear.)

There was also the point that some of the promoters had strong objections on moral grounds to engaging negro labor, and though they might have done something to elevate and improve the conditions of their negroes, other employers of that labor would object to it and would oppose them in every possible way. Then, again, the company would have been under great disadvantages. They could not, for instance, make railways, and there were many other things which they could not do; so that they thought that under the circumstances the wisest course was to abandon the scheme. He also mentioned that the firm of solicitors who had been advising them had very generously offered to forego all their charges in connection with the matter except some sums of £5, 10s, accountant's charges and £7, 15s, for printing, and the Cotton Buying Company's share of the expense would only be about £1, 18s, 6d ($9.35).—(Applause.)

We are at a loss to understand some of the reasons advanced by Mr. Coates for abandoning the American cotton plantation

scheme, concerning which Lancashire has kept the cotton world on the tip-toe of expectation for over two years. What at this late day are the moral objections to employing negro labor in raising American cotton, to which Mr. Coates vaguely refers? What does he mean by "their negroes"? (He spelled it with two gs.) Is it possible that there are people in Lancashire and among the promoters of the late British-American cotton farm, who still think that the possessive pronoun can be legally applied to the black man in the cotton fields? How can the Lancashire men who object to raising American cotton with negro labor allow themselves to spin and weave such a product? What does he mean by telling us that "they (the Englishmen) could not make railways?" A railroad runs through the Heathman plantation, which is but a short distance from the Mississippi? Although it is impossible to understand the numerous reasons Mr. Coates advances, one thing is certain: they appear to be conclusive in Lancashire. This makes us feel like congratulating the promoters of the enterprise for having escaped so many financial, legal, transportation and moral difficulties, whether real or imaginary, at such a low price, $9.35.

The only objection we can understand, to the control of an American cotton plantation by English spinners is the ownership by a foreign corporation. We called attention to this objection some months ago when Mr. Coates and his associates issued their circular urging English spinners to subscribe to the stock of the company. At that time we suggested that the English spinners might find a way around the difficulty by acquiring control through an American corporation. Evidently this course has not commended itself to the English spinners. While the abandonment of the enterprise is natural in the face of the opposition to ownership by a foreign corporation, the opposition is equally natural and justifiable. It is but a few years ago that the British public furnished an illustration of their opposition to foreign ownership of the natural resources of the United Kingdom, when it was rumored that an extensive tract among the Welsh coal fields had been purchased by a German syndicate. The two cases, one involving coal, the other, cotton, are not parallel, but the British opposition in the first and the American opposition in the second are based on the same natural instinct, and one that will be kept alive as long as political distinctions exist.

A New England Cotton Exchange.

The plan to establish a cotton exchange in New England was advocated by James R. MacColl at the recent meeting of the National Association of Cotton Manufacturers, in a paper published in this issue. There are few if any who will question the advantages of such an exchange as Mr. MacColl advocates for New England. The doubts regarding the wisdom of undertaking such an enterprise have been due to a feeling that success could be attained only after many years, while the vicissitudes certain to attend such an institution might easily involve the undertaking in failure.

It being generally admitted that an exchange having on hand a large stock of cotton from which manufacturers could make selections would be of great advantage to both the Southern planter and the New England spinner, the practical question is: How can such an exchange be successfully and quickly established?

We suggest that this object can be attained in the shortest time by making the New England Exchange a part of the new system which is proposed for the New York Cotton Exchange. This proposed system provides for licensing warehouses throughout the South at which cotton is to be stored. Certificates to be issued against this cotton will show the quantity and grade and can be used for trading or borrowing purposes, or for delivery of the cotton. The following letter from a member of the New York Cotton Exchange, who has taken a great interest in the plan to reform the methods of that institution, gives a very clear statement of the advantages of the proposed warehouse system, and of the disadvantage under which a New England exchange would rest:

New York, April 30, 1908.

Editor Textile World Record:

Your letter of the 29th inst. reached me yesterday. I recently pointed out how, in my judgment, the proposed New England Exchange would be handicapped in case we extended our certificate system to Southern warehouses. The profit in handling cotton is, relatively, so very small (1 to 2 per cent. on ordinary uplands cotton, equal to from 10 to 20 "points" on 100 bales) that any regular, continued business therein must, in order to yield a profit, preclude any aggregation of freight charges in competition with cheaper direct, through freight rates from a given point in the South to a given manufacturing point.

Under the establishment of a New England Exchange, therefore, at Boston, for instance, all cotton shipped there for certification and subsequent sale *would have to be sold in the territory immediately contiguous to that market.* Once it had been shipped to Boston, its owners could not readily, and but very seldom, profitably offer that cotton to other parts of the world. This would arise from the fact that the very same kind of cotton could, almost invariably, be offered to the consuming point in question direct from some Southern originating point at a direct freight rate cheaper by 5 to 25 points or the profit on such a transaction, than the combined rates into and out of Boston; not to mention the extra unnecessary handling charges incurred in New England. Precisely from this fundamental trouble the New York market suffers today; in excess degree, however, since we have absolutely no consuming points sufficiently near New York, with respect to which the question of the combined freight rates does not enter as a serious obstacle to business.

For this reason we find it necessary, in reforming our own methods effectually, to leave the bales at their points of origin until they have been sold, in order to obtain between the various primary markets and all the world's consuming centres the most economical direct freight rates. This should make New York a great, general cotton market. If the bales are brought to Boston, the merchants will be practically at the mercy of the consumers in that territory, and the volume of business will thereby be much restricted. If the New York Exchange adopts the proposed plan in a scientifically correct form, every purpose for which the spinner wishes to have a New England Exchange will thereby be fully and impartially served through the New York merchants. Because of the advantages which a broad world's market naturally has over a market which is limited, a New England Exchange would have but little effect on the New York market after our proposed reform. I am trying to judge this matter without bias.

Yours very truly,

R. Siedenburg, Jr.

We shall not attempt here to discuss the merits or demerits of this new plan or of the New England Exchange. We want to suggest that the New York Cotton Exchange and the cotton spinners of New England get together and see whether the resources and prestige of the New York Exchange are not capable of supplying the additional trading facilities that the New England trade needs. There is the possibility, if not probability, that the warehouses in the cotton belt, backed by the New York Cotton Exchange would make a New England exchange unnecessary. Is it not a good plan for the spinning and the exchange interests to confer on this question before each side goes ahead independently? Following is an extract from the long delayed report on cotton exchanges by the Bureau of Corporations, which appears as this issue is going to press:

There are two great cotton exchanges in this country, New York and New Orleans, where organized future dealings are conducted. All future trading on both these exchanges is in so-called "basis" contracts—that is, contracts which permit the delivery of a number of "grades" of cotton on one contract. The seller of this contract may deliver thereon any grade he chooses within the range prescribed by the exchange. The buyer has no option. The proper theory of a basis contract, however, is that all grades shall be deliverable at prices which will make them commercial equivalents of each other. Cotton is graded substantially on its color and on the amount of leaf and other foreign matter, all materially affecting its market value. "Middling" cotton is always the basis grade, the grade for which the price is fixed by the parties to the contract.

There are two ways of establishing these differences. For the last eleven years the New York Cotton Exchange has had a so-called "fixed-difference" system. A committee of the exchange, commonly known as the revision committee, meets twice a year, in September and in November, and establishes the respective price differences on or off which shall apply to the grades other than middling. These differences, once established, cannot be changed until the next regular meeting and govern all contracts in futures.

The New Orleans Cotton Exchange, on the other hand, has what is known as the "commercial-difference" system. A committee of the exchange meets daily and upon information of actual "spot" transactions quotes the prices of the various grades, which quotations virtually establish the differences which apply on future contracts. That is to say, the New York system arbitrarily fixes what the differences for all grades shall be for two months or for ten months, while New Orleans follows the actual market differences for these grades as established by daily spot transactions.

The buyer of a future contract cannot specify the grades to be delivered thereon. He knows exactly the price for one grade—that is, middling cotton. That price was stipulated in his contract, the so-called basis price. But as to the prices which he must pay for other grades he is dependent upon the exchange differences. For all interests legitimately using the exchange, it is highly

desirable that this margin should be comparatively constant in amount—that is, that there should be a substantial "parity" maintained between the spot price of middling cotton and the price of middling cotton on contracts for immediate delivery. A future contract is supposed to represent actual cotton, and from the very nature of things such a parity should be preserved. The respective merits of "fixed" and "commercial" differences are, therefore, roughly indicated by their effect on this parity.

In general, it may be said that the commercial-difference system maintains this parity far better than the fixed-difference system. This is because the commercial-difference system is based on actual daily transactions in cotton, so that the same influences that affect the differences in spot transactions also affect the future contract differences and thus maintain the parity between the price of future contracts and the price of spot middling cotton. Fixed differences are an attempt to establish arbitrarily, and months in advance, the relative values of grades. These differences are bound to become at times erroneous, because the relations of values inevitably vary under the natural laws of supply and demand.

Fixed differences are an attempt substantially to render future transactions a "sure thing" for a limited class of speculative experts. The system amounts to an attempt absolutely to fix prices—an economic absurdity. The relative values of different grades are as much subject to the natural laws of supply and demand as the value of the middling cotton itself, and it is as unreasonable to attempt to fix one by the fiat of a committee as it is the other.

The result of this attempt is to affect the basis price that is paid for future contracts. The law of supply and demand, unable to work directly on these fixed differences, works itself out indirectly on the basis price of the contract; but this indirect action results in great loss to a vast body of persons who are not experts, and who do not understand this artificial machinery or its results. By compelling operators in futures to consider probable conflicts between two sets of differences, as well as possible variations in the price of middling cotton itself, an unnecessary increase in trading risks is introduced. This is clearly an evil. The system results in shifting the burden of risk from a limited class of experts to a non-speculative class, or to those ignorant of the working of the system.

A premium is thus put on intelligence applied to artificial conditions, which, of course, is of no service to the public, rather than on intelligence applied solely to forecasting the actual conditions of supply and demand. In the same way, the system tends to shift the burden of risk from sellers to buyers. Clearly a great advantage is given to the seller from the fact that he can offer on contract any grade he chooses. He should not have both this privilege and the privilege of arbitrarily fixed differences, which almost invariably overvalue certain grades. The result of the combination of the two is to give the seller an extremely unfair advantage over the buyer.

As pointed out, such a disastrous disturbance in the parity is exactly what is brought about by the errors in the fixed differences in New York.

The reply of certain interests in the New York exchange is that "a contract is a contract;" that men who deal there come of their own will and are supposed to understand the game. This position cannot commend itself as sound business ethics. Practically, also, it is not true that cotton interests are wholly at liberty to stay out of the exchange. As shown above, certain interests must have a hedging place. Furthermore, financial connections with New York are so close that New York must be that place for many of them. Still further, the New York Cotton Exchange practically owes its existence to the volume of business made possible by the participation of outside interests. Both the duty of a private business man to his customers and the duty of a concern which is to a certain extent a public utility demand fair dealing.

The injury from such errors in differences as are inevitable under the fixed-difference system is not, however, the limit of possible harm under that system. There is danger that improper differences may be intentionally established. This fixed-difference system, applied thus arbitrarily by a small body of men, furnished in this case a condition where (1) these men had the power thus to reap enormous profits at the expense of others; (2) they admit that they did reap profits; and (3) the motive for doing so was extremely strong. Comment upon this situation is hardly necessary.

The foregoing does not mean that the New Orleans "commercial-difference" system in its actual working has been at all times free from criticism. Disturbances of the parity have also occurred there, but have been by no means as great or as long continued as in New York. The trouble is not in the New Orleans system itself, but in occasional careless or improper application of it—an erroneous quotation of actual prices. There is, however, need of more care in the conduct of the system.

It is contended by many that such a return to the commercial-difference system would, because of the disadvantages of New York's location, destroy the business of the New York Cotton Exchange. There is little reason to believe that any such result would occur. However this may be, the New York Cotton Exchange, if it cannot exist under a just and equitable system, has no excuse for existence at all. The present New York system of fixed differences is uneconomic, in defiance of natural law, unfair, and, like all other attempts to defy natural law, results in such complex and devious effects that the benefit of its transactions accrues only to a skilled few.

The prospect of a reform of cotton exchange methods is an additional reason why New England spinners should co-operate with the New York Exchange in developing the best system that can be devised for all sections of the trade.

The amount of duty collected on the spun silk imported into the United States in 1907 was more than one million of dollars.

How the Canadian Woolen Industry Has Been Ruined.

The story is quickly told. Time was when the woolen and worsted industry enjoyed a healthy prosperity in Canada, giving steady employment to a large number of operatives and providing the greater part of the woolen and worsted clothing consumed by the Canadian people. That was before July 2, 1900. On that date there went into effect the preferential agreement, by which a tariff, already none too high, was lowered one-third on certain products when imported from Great Britain. This reduction struck woolen manufacturing with especial force, and since that date the decline of the industry has proceeded swiftly and with the certainty that unless checked it would soon result in the complete disappearance of the manufacture of woolen goods in the Dominion. Here are the impressive figures showing the size and yearly operations of the Canadian woolen and worsted industry (not including knit goods) in 1900 before the preferential tariff had done its deadly work, and five years after:

	1900.	1905.
Establishments	163	106
Capital	$10,543,598	$6,971,410
Wage earners	6,863	4,647
Wages and salaries	$2,084,697	$1,518,659
Value of products	$7,445,891	$5,871,735

This loss of production was made up by increased importations, principally from England, as shown by the following statistics of imports of woolens and worsteds:

In 1898 under old tariff	$6,203,844
In 1906 under preferential	17,451,833

The 1906 rate of importation is equal to $2.68 per capita for the Canadian population of $6,500,000. Last year woolen goods were imported into the United States under the Dingley tariff to the value of $23,416,534, which is equal to 26 cents per capita for the population of 90,000,000. At the Canadian per capita rate our importations of woolen goods would amount to $241,640,765. Assuming the domestic valuation to be one-third higher, this is equal to $322,187,686, or more than the value ($307,941,710) of all the woolen and worsted goods made in the mills of this country in 1905. Taking the latest statistics of imports and production as a basis, the per capita consumption of woolens and worsteds in the two countries is practically the same, $3.58 in Canada, $3.66 in the United States. The Canadians buy one-quarter of their goods while we buy only one-fourteenth of ours abroad. The production of Canadian woolen and worsted mills amounts to 90 cents per capita; that of our mills amounts to $3.40 per capita.

Recently the Canadian carpet and knitting industries have felt the effects of the low tariff, and Canadian woolen manufacturers of all classes have been brought face to face with the certainty of ruin unless conditions were changed. In this crisis a call was issued by James P. Murray, President of the Toronto Carpet Co., for a meeting of Canadian woolen manufacturers, which was recently held at Montreal. The following extracts from the discussion on that occasion will give an idea of the desperate condition of a once prosperous Canadian industry:

James P. Murray:

> The woolen industry, he might say, is indigenous to Canada. This is proved by the immense number of one-set and two-set mills, which were established all through Ontario, Quebec, and the Maritime Provinces, as the lands were opened up for farming. These small mills were as necessary to the farmer as was the village blacksmith. On every fallow were to be seen the beginnings of what should have developed into a sheep and wool industry. A very large proportion of these small mills are now out of existence.
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> "It is not the mushroom industry," said Mr. Murray, "built in a night which gives the best returns to a country, but the one which, while starting in a small way, expands with the growth of the nation. You have instances all around you in the textile, shipbuilding, iron and other trades, as examples either way. The large woolen mills which were the outcome of this development, and which should have been included in the better class referred to, are in many cases out of business for causes known to you. Though for years we have been asking the Government to investigate the causes of depression in our industry, with a view to giving relief, not a single step has been taken. Even to recent letters to both Premier and Minister of Finance no definite replies were obtainable."

Mr. Murray referred to the reports of American consuls as to industrial conditions in Germany, which were made last year at the request of the editor of the Textile World Record, and said:

If the United States with her prohibitive protective tariffs finds it necessary to get inside information to guard its industries, what do you intend to do to save your investment and your employe's occupation? Would our industry in Canada not have been able to avert much of the wrong it has suffered if one had been properly organized, instead of each working independently, and frequently doing irreparable injury through their conflicting action?

A general discussion of the situation in the Canadian woolen industry followed, from which we take the following extracts:

S. T. Willett, of the Richelieu Woolen Mills, Chambly, said the tariff was undoubtedly the main difficulty to contend with. He was certain that without a readjustment of the Canadian tariff the woolen industry of this country would be ruined. He had been in this business since he was a boy of 12, and he was speaking with a knowledge of the history and development of the industry. In former days when the tariff was fair the woolen mills prospered; but since the preferential tariff came into effective operation, the mills were steadily drifting backwards, in fact the business was going to the dogs. The preferential tariff was built upon a theory, but when it came to the woolen industry it did not meet the actual conditions of the country. It was supposed to be protective within reasonable lines, but when the cost of manufacturing in the two countries was taken into account, it threw the Canadian woolen manufacturer into the conditions of free trade.

Geo. D. Forbes, of the Forbes Woolen Company, Hespeler, thought the tariff was the urgent question and all should be united in a demand for a reasonable amount of protection, which it was felt the woolen manufacturers did not receive. Especially was this the case with the cloth manufacturers. In all classes of woolen goods there should be a specific duty combined with the present ad valorem duty. One trouble was that when patterns were a year old and unsalable at home they were dumped on the Canadian market, and this kind of dumping was not easy to deal with in the absence of expert appraisers.

Henry Stroud, of the Paris Wincey Mills: The main problem was the tariff. The preferential tariff was the beginning of the Canadian woolen manufacturers' troubles. Trade was slack in England now, and this would mean a fresh era of a kind of competition that would soon leave no mills in Canada to protect.

Joseph Horsfall, of the Montreal Woolen Mills: If the present tariff continued another year, more of our leading mills would be closed up. He was of opinion that a tariff of 50 per cent. was necessary for the rehabilitation of the woolen industry.

At the close of the discussion a resolution was adopted appointing a committee of manufacturers to make representations to the government at Ottawa. This committee was received by Sir Wilfrid Laurier and other ministers. Following is an outline of the statements made by the manufacturers at this conference:

It was stated by the manufacturers that despite the tremendous influx of new settlers of recent years, the makers of Canadian woolens were deriving no benefit therefrom, although in many cases the imported goods, which were preferred to our own, lacked the substantial value of the home-made product. It was stated also that British exporters are in the habit of "dumping" woolen goods into Canada at much lower prices than are obtained in the British market, and that this adds to the severity of the competition which Canadian manufacturers must face. The average customs appraiser was not at all competent to pass judgment on the qualities or values of woolen goods, and for this reason they urged that the Government should add to the staff of the Customs Department men who were fully familiar with both woolens and cottons.

The Ministers promised that consideration would be given to the representations made, and it was understood that the manufacturers on their part would supplement their representations with a memorandum of what they desire.

The issue of the Canadian Textile Journal giving an account of the Montreal and Ottawa conferences, contained this significant news item:

Efforts are now being made to dispose of the plant and business of J. H. Wylie, Limited, woolen manufacturers of Almonte, who recently assigned and whose mill is now closed. Meantime the Bank of Montreal has undertaken to pay off the creditors at the rate of 30 cents on the dollar.

This mill was established in 1881, and had 4 sets of cards, 14 looms, and 1,000 spindles. Adverse tariff conditions are the only explanation of the failure.

We commend the desperate condition of the Canadian woolen industry to the consideration of tariff tinkerers in the United States.

Elaborate Plans for the Richmond Convention.

The city of Richmond is fully awake to the coming honor that is to be hers, namely the entertainment of the American Cotton Manufacturers' Association, which will meet for its twelfth annual convention at the Jefferson Hotel on May 20th and 21st. The Chamber of Commerce has been most active in arousing general interest, and visitors may be assured of a cordial southern welcome and a very attractive program for their entertainment. Many parties from the North as well as from the South have already been arranged.

The Way to Reform.

A level-headed, shrewd and experienced business man recently said: "No one accomplishes anything unless he is compelled." The experience of the cotton trade in reforming abuses confirms this assertion. The American cotton bale remains the same old ragged, wasteful, turtle-back deformity simply because the ginners and compress men do not have to change it. Trading on exchanges goes on as before promoting gambling by which both planter and consumer are defrauded, because the members of the exchanges are not forced to stop these methods. One abuse, however, is in a fair way to disappear. It is that connected with cotton bills of lading. European bankers, cotton dealers and spinners have organized and secured the co-operation of the leading shipowners in enforcing their rule that no draft will be accepted for payment unless it is accompanied by a bill of lading of the required form. The following circular letter has been sent out by the chairman of the Bill of Lading Conference:

Cotton Exchange Buildings,
Liverpool, 13th April, 1908.

Dear Sir: At foot I beg to hand you a complete list of those Shipowners and Agents who up to this date have consented to observe the Conference Resolutions. It will be observed that a considerable number of names have been added since my letter of 20th January last.

My Committee are receiving from Bankers in London, Germany, France, Switzerland, etc., letters informing the Committee that they have received instructions from customers engaged in the Cotton Trade not to accept drafts on their behalf unless they are attached to Bills of Lading issued by consenting Shipowners and Agents. It is therefore certain that during next Cotton Season considerable inconvenience, if not loss, will be suffered by those interested in Cotton shipped on vessels whose Owners or Owners' Agents are not on this list, for, as stated in my letter of 31st January, Bankers have resolved "that they will only accept or make advances against Cotton Bills of Lading issued by Shipowners and or Agents who have consented or may in future consent to the Conference Resolutions."

Yours faithfully,
H. KERN,
Chairman of the Committee of the Bill of Lading Conference.

The list referred to includes 96 shipowners and agents comprising the leading firms in the trade. If they stand by the bankers during the coming season the cotton bill of lading abuse will be a thing of the past, and a practical illustration of how other trade abuses can be corrected will be on record.

A Wool Exchange at Omaha.

The plan to establish a wool exchange at Omaha, Neb., has been brought perceptibly nearer realization by the action of the railroads in granting to shippers a through rate on wool from points in the West to the East with privilege of storage at Omaha. It is stated that the promoters of the exchange obtained this concession by agreeing that wool compressing plants would be installed at Omaha, by which it would be possible to ship all wool from that point in hard pressed bales, which would more than double the capacity of a car.

It is proposed to build warehouses at Omaha with a capacity of 75,000,000 pounds of wool. The wool from all sections of the West will be stored here where growers and buyers will meet for the purpose of trading in the staple. Under this system it will no longer be necessary for Eastern wool houses to keep buyers traveling through the wool growing states, as heretofore. The present method is expensive and this has prevented many would-be buyers from dealing direct with the growers. With the business concentrated at Omaha the small dealer will be able to deal with the grower, and the grower will have the advantage of a much wider market for his clip. The plan is attractive and it is to be hoped that it will be carried out in such a way as to fulfil the promise of the prospectus. Among those identified with the enterprise are Charles H. King, a warehouseman at Omaha, Neb., and J. A. Delfenderm, president of the Wyoming Wool Growers' Association.

Woolen Manufacturers and Clothiers Getting Together.

Two committees representing respectively the American Association of Woolen and Worsted Manufacturers and the National Clothiers' Association recently held a joint meeting in New York for the purpose of discussing matters affecting the interest of the

cloth manufacturing and clothing manufacturing trades. The Woolen and Worsted Association was represented by John P. Wood and Charles Porter, Jr., Philadelphia, Pa.; Arthur M. Cox and Theodore Howard, New York City; Edward Moir, Marcellus, N. Y.; Richard A. Strong, New York City; Warner J. Steele, Bristol, Pa. Representing the National Clothiers' Association: Marcus M. Marks, Louis Stern, William Goldman, Harry D. Kohn and Eugene Benjamin, New York City; Ely K. Selig, Philadelphia, Pa.; Sol. Solomon, Rochester, N. Y. The joint committee representing both associations was named as follows: For the Woolen and Worsted Manufacturers' Association: Wood, Strong and Cox; for the National Clothiers' Association: Goldman, Stern and Fleischer. The joint committee is to hold meetings twice a year, in December and June. It is expected that the resulting co-operation between the two associations will be of benefit to both cloth manufacturers and the clothiers.

Profits in the German Color Industry.

The financial report of the Farbenfabriken of Elberfeld Co., presented at the recent meeting of the corporation at Elberfeld, Germany, showed a gross profit for the year of 12,602,411 marks, which made it possible for a dividend of 56 per cent. to be paid on the capital stock and the usual amounts charged off for welfare work. The statement is summarized by the Leipziger Monatschrift from Textil-Industrie as follows:

	Marks.	% on Capital.
Capital	21,000,000	
Profits for the year ..	12,602,411	60%
Welfare work	800,000	
Net profits	11,802,411	
Dividends	11,760,000	56%

The 56 per cent. paid to the stockholders consists of the regular dividend of 36 per cent. and an extra of 20 per cent. In their report the directors state that the 15,000,000 marks of new stock issued last year for the purchase of the Auguste Victoria coal mine will be entitled to dividends from July 1, this year. They also refer to the new branch works in England, to be built by a subsidiary company, called the Mersey Chemical Works, with a capital of £200,000, none of which is to be issued to the public. These branch works have been established to protect the companies' patents under the new British Patent Act.

Seasonable Fabrics.

DRESS GOODS.

The demand for light weight fabrics in the popular spring shades has increased considerably, and most of these shades such as Copenhagen, rosset and golden brown have been scarce on the market.

Diagonal weaves and herring-bone stripes are selling very well and will be very good during the coming season in the different monotone colorings. Fig. 1 shows a 54-inch stripe from Boesneck, Broesel & Co. at 72 1/2 cents a yard.

Plaids and checks are still being displayed with success in black and white and subdued colorings.

Crisp finish voiles are receiving the attention of the buyers for fall. Some of these goods are being offered at a slight reduction over last year's prices.

Although the fall dress goods business opened up much later this season than usual, reports from the domestic and foreign selling agents show that a great many orders are being received for their various fabrics. While these orders are not as large as in former seasons the business already booked has given them confidence that the market is improving. A great many buyers who have been holding off the placing of their fall dress goods orders, have come to the front within the last week or ten days and have placed a good part of their business, especially their import orders, as they realize that they must give their assortments at once to secure deliveries for the early fall.

Broadcloths are receiving first call, especially in the fine chiffon finish stripes. It is predicted that next fall will be an exceptionally big broadcloth season.

Fancy soft finished worsteds and shadow striped panamas in the popular shades of browns and blue are very strong.

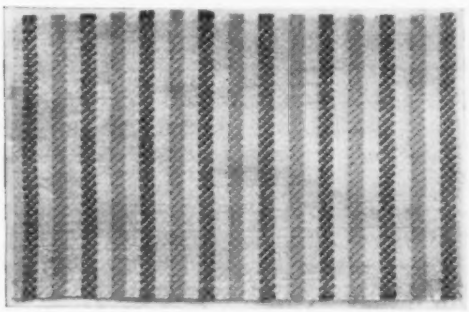


FIG. 2.

Hair line stripes have been selling very freely.

SILKS.

Very few changes have taken place in the silk market of late. Business has simmered down and things are very quiet throughout the market in general. As the spring season is now practically over, most of the manufacturers are willing to let out their remaining stocks at reduced prices, and have made a few sales.

Rough pongees in plain and fancy self colored stripes and figures are selling very well in all of the popular shades, such as Copenhagen blue, tan, leather brown, reseda, etc., in qualities ranging from 50 cents to $1.05 a yard. Fig. 2 shows the 26-inch "Mandarin" made by M. C. Migel & Co. at $1.05 a yard in all colors. From the present outlook it is very evident that pongees will be very desirable during the entire spring and summer seasons.

Foulards are being used very extensively this season.

A great many calls are being received for two-toned stripes and checks in 19-inch taffetas in the desirable shades of blues, browns, tans, etc.

The manufacturers are turning their attention to the fall and winter trade. From samples that have already been shown it is very evident that hair-line and two-tone stripes will be popular.

Satins will be in very good demand, especially for the cutting-up trade.

Orders are being received for colored taffetas in the desirable shades, although these goods are being offered at about 15 per cent. less than last year. The yardage sold so far this season shows a decided falling off.

Yard wide black taffetas are being offered at some very attractive prices. It makes the different buyers smile when today's prices are quoted on these goods. But a short time ago the same brands were offered at sky high prices, with no break in sight. However the manufacturers have curtailed

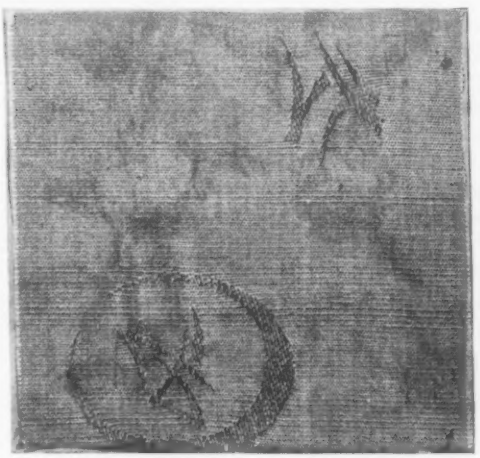


FIG. 1.

their production on blacks and it is a question how long these low prices will continue.

COTTONS.

The sheet and pillow case market has been very active. Orders are being received for these goods in all sizes. While these orders are not as large as last season, there is a steady demand for the goods, which indicates that the stocks are low and that buyers will be ready to lay in their supply as soon as they feel that the market is settled.

The white goods business has not changed

to any extent. Calls are being received for staple numbers of India linons, Persian lawns, nainsooks, etc., at prices about 10 per cent. under the opening quotations.

Striped and barred white lawns are selling very freely in goods to retail from 15 to 25 cents.

The fall buying of flannels and blankets started much later this season than usual. Orders that are being placed are not as large as was anticipated, as the buyers feel confident that they will be able to pick up some cheap merchandise during the season.

The unsettled condition that has prevailed for some time seems to continue in the cotton goods market. While business in general has not been up to the standard this season, the steady demand for staple cottons has given the market encouragement for the future. Prices have been reduced throughout the entire line and goods are being offered at what is considered the low water mark prices.

Since the price on Fruit of the Loom 4/4 bleached muslin was reduced to 9 cents, orders have been coming in so fast that the jobbers were cleaned out of all of their old stocks. In buying new stocks they advanced the price to 9 1/2 cents and still receive a great many orders. Low end domestics have been reduced to some attractive prices, but the trade has not taken hold as well as was expected.

The reorder business on dress ginghams has not been as good this season as in former years. The agents are holding to their opening prices. Some of the jobbers are letting out their Amoskeag A. F. C. and Utility ginghams at 9 and 8 cents respectively. This is about a cent a yard under the opening price.

J. Harper Poor & Co., selling agents for the Toile du Nord ginghams, advised the trade that they would hold their price of 11 1/2 cents for fall business.

The value of the total trade of the United States with the port of Bombay increased from $1,658,510 in 1906 to $2,676,121 in 1907, which is but a little over 3 per cent. of the whole.

STYLE SUGGESTIONS FOR WOOLEN MANUFACTURERS.

The demand for browns in the spring weight fabrics has been so good that some manufacturers are running on these for May delivery, but the season is getting so late that it is hazardous to make any more spring goods. There are unmistakable signs of a good heavy weight business and orders will be placed soon. Some manufacturers already have good duplicates, but the great majority of the trade have not bought more than a sample piece and in many instances only a cut and these will surely not pay expenses, so they must sooner or later buy quantities.

The time is getting so short, however, in which they can place orders, have goods made and then cut them up into clothing that unless orders are placed very soon they will have to resort to stock goods, and a great many commission merchants are of the opinion that the late fall will see the market cleared of goods.

The heavy weight business has been done in spots, that is, a few particular fabrics have had a good business, and the principal ones are getting duplicates.

The largest selling worsted fabrics have been the cross dyes and while many agents are positive that their colors are fast, a short sun test will prove that they are not. A few weeks ago it looked as if the cross dye worsteds would be the only ones in demand in light weights, but the experiences of the trades with shady and otherwise imperfectly dyed heavy weights have changed their ideas. It is true that the cross dyes can be produced cheaper than the yarn dyes, but is it cheaper if the customer gets a suit which will fade in three or four days and thus be dissatisfied?

While a great many manufacturers are working on the cross dye fabric idea, and making themselves no end of trouble, the more conservative ones are sticking to the yarn dye, and without doubt the latter class will have the larger business. But in cross dyes the alizarine fast colors only should be made. Of course the demand is going to be for bright, snappy effects and the acid dyes produce these best, but they are the most

fugitive and consequently the least desirable.

When garments fade too quickly many of the clothing trade simply think it is a chance to get back at the manufacturer and put in claims which are out of all reason. Of course it is nothing more or less than blackmail, but in the words of the immortal Tweed, "What are you going to do about it?" If the claim is not allowed nine times out of ten the customer is lost and if it is all the profit goes and more too. The writer has had a number of the prominent heavy weight cross dye fabrics exposed to the sun and air for three or four days and the lighter shades fade so quickly and decidedly that they are practically new styles. This means trouble.

The light weight and heavy weight worsted styles have been principally stripe patterns of various widths and the new light weight season shows a decided tendency to shadow plaids and some checks, both fine pin checks and the larger ones, but the large shadow effects are going to be most in demand.

It is a question also if browns have not been overdone in the lighter shades and while they undoubtedly sell largely the coffee browns will be the best. Along with these will sell the stone greys and stone drabs and olive drabs. The harmonious combination of colors to produce bright effects will be in greater demand and show decided contrasts.

There has been more demand for covert cloths than for some time. These in light tans, with fancy stripe patterns and fancy threads, will sell in all the various grades. It looks now as if the wet brush finish covert would sell better than the regular finish, which is more open than others.

The light weight overcoating business is always larger for fall than for spring, but the fabric which will sell is a close cheviot twill, not a long napped fabric, but a very close one, in light blue, grey, brown and drab mixes. This should be made to weigh about 14 to 15 ounces and a great many fine effects are obtained by using self stripes.

The close finished cassimeres should be made in the same shades as indicated previously, and as the better grade of these very nearly approach the price of the cheaper worsteds, great care should be taken in the styling of them. The patterns must be clear and bright and this also applies to the cheaper fabrics. The cassimere finish desired is one in which the nap on the cloth stands up straight and can be rubbed both ways.

In regard to the making of pin checks some years ago when these were in vogue, a fabric was produced using a straight cotton warp and a wool filling and a fine 200 Egyptian cotton twisted on. This in a plain basket weave made a fabric which was sightly and was produced cheaply. This fabric will sell again.

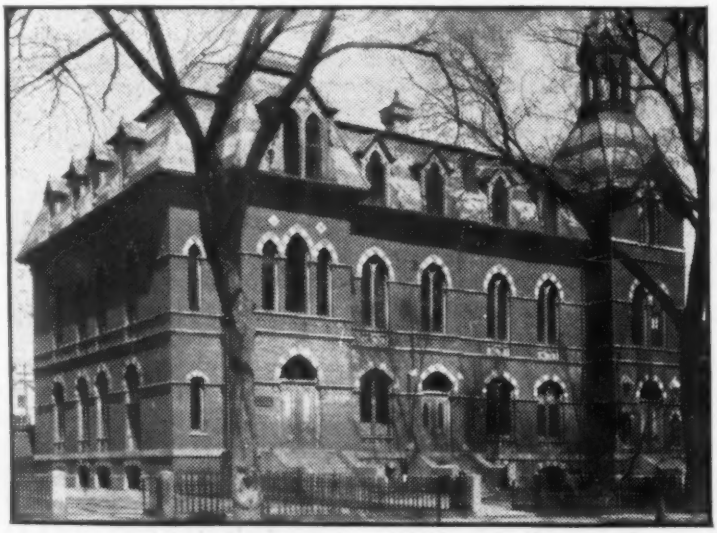
The black and blue goods market was never so dull as at present. This also applies to thibets. These are good fabrics to keep away from, as is also the black and blue unfinished worsteds. These are in stock in large quantities and any attempt to make them would meet the competition of large quantities of stock goods in the hands of merchants looking for a chance to place them.

THE NEW LAWRENCE TEXTILE SCHOOL.

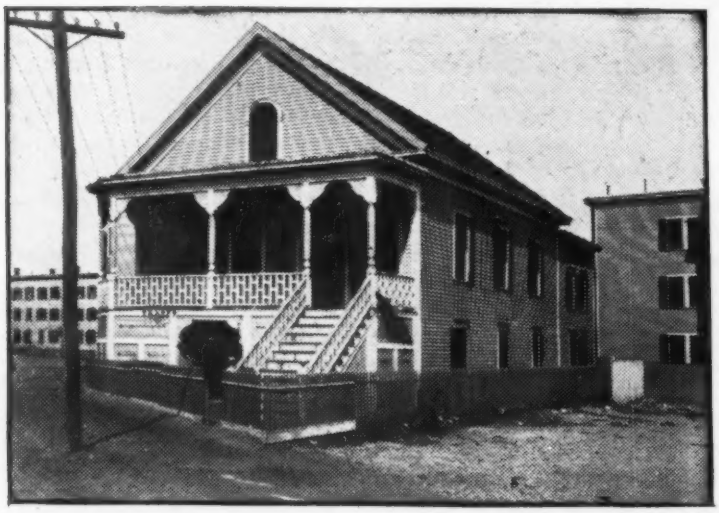
The Lawrence Textile School was conceived less than a year ago. The accompanying illustrations of the buildings that are to be used for this school show the remarkable rapidity of its development, which has been due primarily to the great need of such an institution in that industrial center. Industrial superiority depends on industrial training and education, and this training and education can be accomplished best not by the necessarily rude methods of the mill, but by those methods supplemented by industrial schools. It was such a school that Lawrence lacked a year ago. The deficiency has been supplied with a speed and on a scale that no one dreamed of. What has been accomplished reflects great credit on those enthusiastic, farsighted and energetic promoters of the enterprise. The result is that Lawrence is now provided with the means of educating in a systematic manner its large population of textile and other workers.

The plan to establish this school has had the support of all classes of people, employers, employes, the city government and the public generally. The city took the first step in providing the financial support by mak-

ing an annual grant of $5,000. This under the Massachusetts law was supplemented by an additional grant of $5,000 by the state government, making a total of $10,000 a year.



DEPARTMENT OF COTTON, WOOLEN AND WORSTED AND STEAM ENGINEERING. ENTIRE BUILDING OCCUPIED BY THE SCHOOL.



DEPARTMENT OF WEAVING AND DESIGNING.

The school was organized early this year under an independent industrial school commission composed of Dr. M. F. Sullivan, President of the Board of Trade; Walter H. Summersby, agent of the Atlantic Mills; James P. Barnes, head designer of the American Woolen Co.; A. X. Dooley, attorney at law, and James P. Cameron, a wheelwright representing organized labor. This commis-

sion selected as principal of the school and secretary of the commission, Wm. H. Dooley of the Lawrence High Schol Faculty.

CLASS IN DESIGNING AT THE LAWRENCE TEXTILE SCHOOL. A QUESTION BOX IS SEEN IN THE CORNER OF THE ROOM.

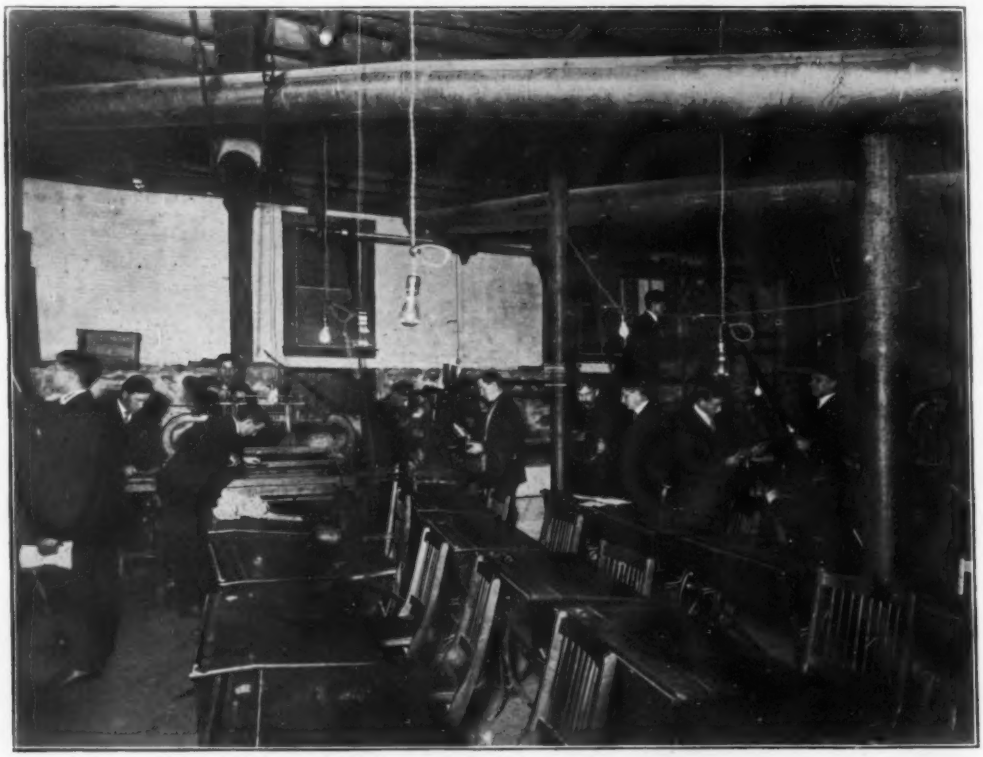
DEPARTMENT OF CHEMISTRY, DYEING AND TEXTILE PRINTING.

The school opened this year as an evening school for those already engaged in the trades, with a registration of nearly 700. Courses are offered in cotton, woolen and worsted manufacturing, steam engineering for engineers, firemen, etc., arithmetic and blue print reading for machinists.

THE WOOLEN AND WORSTED COURSE.

The courses in woolen and worsted manufacturing are arranged to meet the needs of those working in the industries of this great

textile center. Instruction is given in all the processes employed in the mills. Excellent



CLASS IN WEAVING AT THE LAWRENCE TEXTILE SCHOOL.

ACADEMIC DEPARTMENT, LAWRENCE TEXTILE SCHOOL.

up-to-date woolen and worsted machinery is being installed. While the machinery is being set up a class is formed in worsted machinery erection for overseers and second hands.

THE COTTON COURSE.

The cotton course, like the woolen and worsted, is designed to meet the needs of the

men in the industries, to make them better workers and train them to think and take an interest in this work. This training does not lie in the actual operation of machines, but rather in the knowledge of how to adjust the parts of the machines to suit varying conditions necessitated by different classes of work. The use and structure of each portion of the machines is studied in its relation to the other parts with reference to its effect on the product. Starting with the desire to produce a certain yarn, all the necessary calculations of speed and delivery are made, so that the proper amount of work may be done at each operation and the fiber handled with the least amount of injury and waste. If a sufficient number of pupils register, classes will be formed in picking, carding, drawing, roving, spinning, combing, mule spinning, designing and weaving. In connection with this work a course in knitting is offered to show how it differs from weaving. Manufacturers have contributed machinery to the value of $20,000. While the machinery is being erected a class is formed in cotton machinery erection. This is unique, but interesting and valuable.

LECTURE HALL FOR THE LAWRENCE TEXTILE SCHOOL, ON SECOND FLOOR, SEATING 500.

THE DYE HOUSE AND LABORATORY.

This work is carried on in a building located in an ideal spot for a dye house. It is situated on the banks of the Merrimac just above the falls. It is modeled after one of the most practical experimental laboratories in the country.

Besides lectures and recitations upon dyeing, students will perform careful and systematic experiments on the nature of the various dyestuffs and mordants, their coloring properties, their action under various circumstances, and the conditions under which they give the best results. The more representative dyestuffs of each class will be applied to cotton, wool, and silk and each student will arrange in a book a specimen of each of his dye trials with full particulars as

to conditions of experiment, percentage of compound used, time temperature of dye bath, etc.

For convenience and economy most of the dye trials will be made with small lots of the required materials, but from time to time students will be required to dye larger quantities in full size dyeing machines under the conditions of a practical dye house.

By the use of a printing machine the principles of calico printing are illustrated. The practical side of the subject will be studied, and it will be the constant endeavor of those in charge to impart only such information as will be of value in the dye house.

In industrial chemistry particular attention is paid to those subjects which are of especial interest to the textile worker, as oils, soaps, gas and the coal tar industry, and the manufacture of important chemical compounds, such as common acids, alkalies, bleaching powder, various mordants, etc. Cabinets containing the various dyestuffs, chemicals and by-products of the industry are on exhibition in the dye house and the workers have an opportunity to study them.

STEAM ENGINEERING AND ELECTRICITY.

One of the important departments in the school is the course in steam engineering and electricity. This course consists of lectures by practical men who are specialists in their respective branches, arithmetic for engineers and firemen, and laboratory practice in steam engineering. The steam engineering laboratory is one of the best equipped laboratories in the country, consisting of different types of boiler, steam heating apparatus, single and double acting pumps in section, sectional valves and gages, all the boiler accessories, steam engines and many other machines. In addition to all these, pictures, blue prints, sketches and models are on the wall for careful study. All the lecture classes and demonstrations are planned to meet the needs of those working in the trades. Classes are formed afternoons for those working nights and evening sessions for those working during the day. This is the first free steam engineering laboratory in the country.

A FREE SCHOOL.

This school is open free to all those working in the trades in Lawrence or any of the adjacent cities or towns. No examination is required except the fact that the applicant is a worker.

It is the intention of the commission at an early date to open the school as a free day school to the boy between 14 and 18 who desires to study the textile and mechanical arts. Most of our textile schools charge a tuition of $150 without any promise of a free scholarship. It is clear that any school doing this is keeping out the bright boys, although poor, who are anxious to go in the mill after the age of sixteen. A boy who spends four years from 14 to 18 in a secondary school of this kind will do better and far more efficient work in the industries than the boy who graduates from the textile schools with the expectation of being made a mill agent immediately. The main object of the Lawrence school is not to turn out mill agents but to turn out more efficient workers who are willing to begin at the bottom of the ladder and when the proper time comes to be ready to fill the more responsible positions.

WASHINGTON NOTES.

(By Our Special Correspondent.)

During the past two weeks the Committee on Patents of the House of Representatives has given a number of hearings in relation to the retaliatory patent bill, the outcome of which doubtless will be an amendment to the existing law in the form of a single additional paragraph. Two bills have been introduced this session by Mr. Currier of New Hampshire. H. R. No. 15,839 was introduced January 30 and was followed on February 24 by H. R. No. 17,869, both bills to amend Section 4,886 of the Revised Statutes relating to patents, the second measure having been modeled on the British patent bill, which, I am informed, was chiefly directed against the German chemical industries and American manufacturers of shoe machinery.

* * *

American experts in patent law have made a study of the two bills introduced by Mr.

Currier, and the object of the hearings before the Patent Committee of the House has been to bring out the defects in these bills that the requirements of the case may be fully met without complicating the legal aspects of the matter. It has been urged that in attempting to right the wrongs that have been perpetrated upon American inventors by foreign countries, we should not administer heavy blows to these inventors and their rights in this country, and that the difficulties should be carefully studied before any retaliatory law is placed upon the statute books.

The practical difficulty with H. R. No. 15,839 is that it provides that any patent issued to a citizen or subject of another country shall be upon the same terms and conditions under which a patent is granted in that country to a citizen of the United States. So far as it provides for a specified term there is no complexity that is insurmountable. But the provision that citizens or subjects of foreign countries shall have patents in this country upon the same conditions as citizens of the United States in those countries is one which if enacted into a law would lead to great complexity because the conditions upon which patents are granted in foreign countries are extremely various, and the Commissioner of Patents would have to regard all of these conditions when acting upon the application of citizens or subjects of foreign countries. The work of the Patent Office has now become so complicated and the office so overburdened that months must elapse after an application has been made before the patent can be granted. The complication of court proceedings in infringement cases is also taken into the consideration, and the slowness of the courts in this country compared with court proceedings in foreign countries cannot be lost sight of.

* * *

It is claimed that if H. R. No. 17,869 were to be enacted as it now stands, it would mean the adoption of the new English system for all American patents, including patents granted to American inventors. Its purpose is to give a foundation for negotiations with Great Britain, and perhaps other nations, to induce them to modify their attitude. But the bill is open to the objection that it introduces into the patent system of the United States an entire new line of litigation, when the object of new legislation should be to reduce litigation, and to reduce the proceedings of the courts. Another objection to the bill as now framed is that it would have a tendency to cause wealthy manufacturers to withhold the purchase of patents of poor inventors until the expiration of the time limit, and thus secure them without cost. All that a foreign concern would need to do would be to wait until the patent lapsed, by reason of the inability of the poor inventor to work it, and then proceed without regard to his rights.

* * *

On the other hand it was asserted at one of the hearings, by one who spoke with authority, that many foreign patents could not be worked in this country with profit even if the patent rights were given in this country absolutely without cost. The German chemical industries were particularly cited, and it was shown that where patents have expired upon certain products having a tremendous sale in this country, the German manufacturers are still supplying the market, with a rapidly increasing trade. Having been long established, with a complicated system of manufactures embracing many products and by-products, competition would be next to impossible.

* * *

It is now suggested to amend Section 4,920 of the Revised Statutes relating to patents by adding after the fifth paragraph, another clause. The section provides that in any action for infringement the defendant may, as a matter of defense to the charge of infringement, prove on trial any one or more of certain specified matters which are stated in five paragraphs. The proposed amendment provides that if the defendant in a suit for infringement of part shall prove that after four years from the date of the patent the patented article or process is manufactured or carried on exclusively or mainly abroad, the said defendant shall not be held to be an infringer of a valid patent.

Notwithstanding that the House Committee on patents has been active in this matter, there is little likelihood that any patent legislation of a retaliatory nature will be passed this session, and it may not even be reported. As our solons on the hill are determined to get through by the middle of May, to get home to attend to fence repairs before the heated term sets in, all such needed legislation must wait.

* * *

I am permitted to make public portions of an unpublished letter from Consul General Jas. S. Rodgers, Havana,—until recently Consul at Shanghai, China,—on a subject of interest to Textile World Record readers. He says: In relation to the ramie product of China, I beg to state that during my residence in China I investigated the subject many times, the result being that I could not find much to encourage a commercial enterprise to be devoted thereto. Ramie has been for many years one of the favorite subjects of discussion by those who seek prospective fortunes, but my information from many who have gone into the subject in great detail has not been exactly reassuring. The great trouble has been to find a successful decorticating process other than by hand, in which the Chinese excel all other races.

I have before me the figures of exportation of ramie for 1906, they being the official result as announced by the Chinese Imperial Customs. In that year 16,044 piculs (133 pounds) were exported, the value being placed at 163,786 Haikwan taels (80 cents U. S. Gold). Of this amount Japan took 60 per cent. and European countries the remainder. The English merchants took only a trifle of the exports. The statistics of 1905 show about the same relative percentages, the total export having been 14,757 piculs. In 1903 and 1904 the exports were only 1,731 and 1,584 piculs respectively, most of the product of 1903 having gone to England and that of 1904 to Europe.

It should be understood that these figures do not represent anything like the amount of the supply of ramie. In 1905 the District of Hankow exported to the manufacturing centers of China 153,005 piculs, and in 1906, 156,853 piculs. Most of the grass-cloth has heretofore been manufactured in the Kwantung Provinces, the city of Canton being the headquarters for the manufacture. There is undoubtedly an unlimited supply of the raw material.

* * *

A new fiber plant has just been brought to notice by the Philippine government, samples of the fiber of which have recently been sent to the United States. Its native name is "Anabo." It is regarded as "one of our promising fiber plants, as it is widely distributed in the islands, requires little cultivation, and produces a fiber of fairly good quality." I find this to be the "Abroma Augusta," or Devil's Cotton, a small perennial tree, wild and cultivated in the hotter parts of India and Mauritius. The plant, in India, grows three crops per year, and is said to be more easily cultivated than jute. In past time it has been chiefly employed for cordage by the natives of the districts where it thrives.

RENOUARD.

AIR CONDITIONING.

Editor Textile World Record:

I have received Mr. G. B. Wilson's book on "Air Conditioning," recently purchased through your book department. When I first glanced through it I did not realize who Mr. Wilson was or that he had any connection with or interest in makers of apparatus for air conditioning. In the preface to his book he stated that very little matter had been published on this subject other than circulars and pamphlets by parties interested in the sale of their own particular apparatus; and also that he had felt the importance of a proper examination into this very neglected question by technologists as well as practical men, and that so he had been led to publish this work.

After this and in the absence of anything whatsoever to the contrary, I assumed that he was an entirely disinterested person, and therefore looked forward with a good deal of pleasure and profit to following his line of argument. As I read along, however, the suspicion arose in my mind that the writer either had a very deep sympathy with a cer-

tain definite type of apparatus, and was even interested directly in the manufacture or sale of one; by the time I reached the end of the book this suspicion had been strengthened into conviction.

By carefully comparing his published descriptions of various types of apparatus for air conditioning, with his specifications for an "Ideal" system, it was quite apparent that his sympathies were with the Kestner System. It then occurred to me that this Mr. G. B. Wilson was Mr. Kestner's brother-in-law, whom a mutual friend once told me represented the Kestner System in this country, and who wanted to meet me the next time I was in Boston.

Just here I can only express regret that I didn't meet Mr. Wilson, because I would like to have modified my recommendations for card room humidities, which he copies on page 49 as first advanced by me and published in a pamphlet entitled "Recent Development in Air Conditioning," read at a meeting of the American Cotton Manufacturers' Association, in Asheville, N. C., May, 1906, see page 25. A couple of years' experience with automatic regulators, permitting quick adjustment to higher and lower scales, as may be desired, has brought out the fact most strikingly that for each department in each particular mill, there can be found a scale of humidity at which the work will run best, and that these scales vary considerably for the same departments in different mills. Furthermore, that the most desirable scales of humidity do not vary at different temperatures as shown in my table of recommendations for card and spinning rooms, which are parallel to those of the English Cotton Cloth Factories Act, but run parallel to the tables of humidities for various percentages of regain observed and compiled by Mr. William D. Hartshorne in a paper read before the New England Cotton Manufacturers' Association at Atlantic City, September 21, 1905. The scale of maximum limits of humidity at different temperatures, enacted in the English Cotton Cloth Factories Act must have been made with entire reference to the relative effect on the operative rather than the working of the fiber; whereas, Mr. Hartshorne's tables of regain deal entirely with the most advantageous scales of humidities with respect to the working of the fiber; our present practice therefore incorporates the requirements of both of these authorities by adapting Mr. Hartshorne's scales of regain, but with an auxiliary setting of our regulators so that at the maximum limits the figures in the English Cotton Cloth Factories Act will not be exceeded. And to permit of finding the exact scale at which the work in each room runs best, we now make our regulators with switches provided for 14 different scales of humidity at different temperatures, arranged as above stated.

But to return to the subject of this communication:

Probably in New England and abroad Mr. Wilson is quite well known, and his relationship to Mr. Kestner and the Kestner apparatus thoroughly understood; but in the South no one that I have mentioned this matter to knows these facts. As your magazine goes to Southern and Northern mills alike, it therefore occurs to me that this communication is not only in order, but desirable, in justice not so much to Mr. Wilson's competitors, but to the public at large. I have no doubt Mr. Wilson did not seek to mislead anyone, but I feel as a maker of apparatus for this purpose, that it is my privilege to prevent the public from misleading itself through lack of acquaintance with the author of this very interesting book.

As trade literature it is most timely, for the subject of air conditioning is undoubtedly becoming more considered in the United States than at any previous time in the history of manufacturing. While I do not agree with all the statements of the author, I think it a desirable publication for anyone to procure who is investigating the subject of air conditioning,—always bearing in mind, of course, that both the sympathies and the commercial interests of the writer are with the Kestner System. Knowing this fact, the reader will be enabled to give the proper weight to each statement made, and to make the proper allowances for each expression of preference and selection.

STUART W. CRAMER.

Charlotte, N. C., April 14, 1908.

HOSIERY AND KNIT GOODS MANUFACTURERS' CONVENTIONS.

The National Association of Hosiery Manufacturers and the American Knit Goods Manufacturers' Association hold their annual conventions during the week of May 11th to 15th at the Continental Hotel in Philadelphia. The first named Association holds its sessions on Monday, Tuesday and Wednesday; the underwear manufacturers' meetings are on Thursday and Friday. An interesting program has been arranged by the executive committees, and the questions to be discussed are of importance to manufacturers.

The meetings of the knit goods associations differ from the cotton manufacturers' conventions in so much that the papers presented and the subjects discussed are almost entirely along the lines of marketing the product rather than technical papers relating to the manufacture of the goods. The sessions are held behind closed doors and only manufacturers are admitted. There is a freedom of discussion and plain talk which has been productive of much good. Different sub-committees discuss the questions of special interest to the manufacturers of particular classes of goods. The growth of these two associations has been very rapid during the past few years and the annual gatherings in Philadelphia are now looked upon as regular features of this industry.

The exhibition, which has been held for the past two years, and which was particularly successful last year, is held in the same building, 809 Chestnut Street, almost opposite the Continental Hotel. At the time of going to press, practically all of the exhibition space had been rented and there is every indication that the success of last year will be repeated. A new feature will be inaugurated at this convention which will make it easy for delegates and visitors to become acquainted and learn "who is who." The plan has been tried at other large conventions and works very successfully. Each delegate and visitor will upon registration be given a numbered badge. From these numbers an index will be prepared with the name of the person and his number set against it. Copies of this list will be printed daily and distributed to those in attendance at the convention and the exhibition, so that there will be no occasion for anyone remaining unacquainted with the name of anyone he is interested to look up. For the hosiery and knit goods manufacturers Nos. 1 to 499 will be used, and to the visitors, exhibitors and other guests Nos. 500 to 750 will be given. The registration office is located in the exhibition hall, booth No. 23. The plan is expected to promote wider acquaintance and it is hoped that the visitors will not stand upon formality but introduce themselves to those they are desirous of meeting.

Program of Convention.

NATIONAL ASSOCIATION OF HOSIERY MANUFACTURERS.

Monday, May 11—Morning Session.

Reading of Minutes of 1907 Convention.
Annual Report of the President.
Report of Secretary-Treasurer.
Report of Transportation Committee.
Report of Membership Committee.
Report of Grievance Committee.
Report of Press Committee.
Report of Legislative Committee.
Report of Statistics Committee.
Reports from Sub-Associations.
Report of Executive Committee, read by J. H. McPhail, Nashville, Tenn.
Address, "Trade Associations, A World Power: a prophecy or a pipe dream, as you choose to regard it," Fred W. Simons, Frankford, Philadelphia, Pa.
Appointment of Special Committees.
Communications.
Miscellaneous Business.
Discussion of Executive Committee's Report (each speaker limited to five minutes.)

Afternoon Session.

Only hosiery manufacturers admitted. Sub-meeting of Manufacturers of Children's Ribbed Hosiery, P. C. Withers, Chairman. General Meeting in Convention Hall.
Roll Call.
Report of Cost Finding Committee, Fred W. Simons.
Report of Cost Accounting Committee, J. H. McPhail, Chairman.
Address, "Unjust Cancellations," F. L. Chipman, of Chas. Chipman's Sons, Easton, Pa.
Open Discussion. Each speaker limited to five minutes.
Opening of Question Box.
General Discussion on Questions Submitted.
Parlor C. Sub-meeting of Manufacturers of Men's Half Hose up to 176 needle, Harold Lamb, Chairman.

Tuesday, May 12—Morning Session.

Only hosiery manufacturers admitted.
Open Discussion on the following Subjects:
Advantage of Uniform Terms.
Interchange of Credit Information.
Net Weight Yarns.
Communications.
Miscellaneous Business.
Opening of Question Box.
General Discussion.

Afternoon Session.

Only hosiery manufacturers admitted. Sub-meeting of Manufacturers of Women's Flat Seamless Hose, Julian S. Carr, Jr., Chairman. General Meeting, Convention Hall.
Open Discussion on the following Subjects:
German Reciprocity Agreement.
The Tariff.
Ways and Means to Eliminate Trade Abuses.
Sub-meeting of Manufacturers of 200 needle and over Seamless Half Hose and Full-Fashioned Hosiery of all kinds.

Wednesday, May 13—Morning Session.

Only hosiery manufacturers admitted. Convention Hall, Continental Hotel. Meeting called to order promptly at 10 o'clock.
Reports from Special Committees.
Reports from Chairmen of Sub-Meetings.
Miscellaneous Business.
Discussion.

Afternoon Session.

Only hosiery manufacturers admitted. Continental Hotel. Meeting called to order promptly at 3 o'clock.
Reports of Special Committees.
New Business.
Resolutions.
Election of Officers.
Appointment of Committees.
Miscellaneous Business.
Selection of Dates for next Meeting.
Adjournment.

AMERICAN KNIT GOODS MANUFACTURERS' ASSOCIATION.

Thursday, May 14—Morning Session.

Only knit goods manufacturers are invited, members and non-members. Meeting called to order promptly at 10 a. m. in Convention Hall of the Continental Hotel.
Reading of Minutes of Last Convention.
Annual Report of the President.
Report of Secretary-Treasurer.
Report of Executive Committee.
Discussion of Executive Committee's Report. Each speaker limited to five minutes.
Appointment of Special Committees.
Communications.
Miscellaneous Business.

Afternoon Session.

Preliminary meeting for the organization of Sub-Associations, looking towards closer co-operation of manufacturers interested in similar lines of goods. General Meeting in Convention Hall.
Roll Call.
Open Discussion on the Following Subjects:
Ways and Means for preventing Unjust Cancellations.
Advantages to be derived through the adoption of a Uniform Order Blank.
Possible benefits through the adoption of Uniform Terms.
Opening of Question Box.
General Discussion on Questions Submitted.

Friday, May 15—Morning Session.

Only knit goods manufacturers admitted. Convention Hall, Continental Hotel.
Open Discussion on the following Subjects:
Interchange of Credit Information.
Net Weight Yarns.
Elimination of Freight and Cartage Allowances. Would it prove beneficial or otherwise?
Special Packing. Can this abuse be corrected?
Communications.
Miscellaneous Business.

Afternoon Session.

Only knit goods manufacturers admitted. Meeting of Sub-Associations. General Meeting in Convention Hall.
Reports from Special Committees.
Reports from Chairmen of Sub-Meetings.
Miscellaneous Business.
New Business.
Resolutions.
Election of Officers.
Appointment of Committees.
Selection of Dates for Next Meeting.
All knit goods manufacturers are earnestly requested to convene promptly and to remain in the Convention Hall until adjournment.

DIRECTORY OF EXHIBITORS.

	Space
Registration and Association Office	23
American Drying Machinery Co.	28
Jacob K. Altemus	7
Beckhert Needle & Supply Co.	33
Berlin Aniline Works	1
Cheney Brothers	21
The Credit Office	35
Diehl Manufacturing Co.	46
Grosser Knitting Machine Co.	40
Harding & Fancourt	39
Hemphill Manufacturing Co.	16
J. W. Hepworth & Co.	10
Ideal Hosiery Printing Co.	32
International Sprinkler Co.	42
E. Jenckes Manufacturing Co.	8
Kaumagraph Co.	34
Lord & Nagle Co., Textile World Record	38
Manufacturers' Supplies Co.	5
George D. Mayo Machine Co.	9

Mayo Machine & Needle Co. 13
Merrow Machine Co. 3
New England Cotton Yarn Co. 12
New York Silk Conditioning Works ... 44
Nonotuck Silk Co. 36
Nicetown Dye Works 4
Paxton & O'Neil 6
Philadelphia Drying Machinery Co. 2
E. A. Posselt 15
Robinhold Machine Co. 11
Roessler & Hasslacher Chemical Co. ... 31
Salvator Transfer Co. 14
Singer Sewing Machine Co. 48-50
Smith, Drum & Co. 43-45-49
Standard Machine Co. 37
Stevenson & Mulhart ..... 17 & 19
Sunbeam Incandescent Lamp Co. 22
James Taylor 18
Textile Manufacturers' Journal 41
L. J. Wing Manufacturing Co. 49

CHARACTER OF EXHIBITS.

Grosser Knitting Machine Co., 260 Broadway, New York, occupies a large space in the centre of the hall, and has an extensive exhibit. One machine table is occupied with German loopers in full operation. Another machine table has overseamers. Hosiery of the full fashioned and seamless type is looped, and full fashioned goods seamed up in the presence of visitors. Their new large dial machine is on exhibition for the first time, and will attract much interest. This looper is 16 inches in diameter, with all the advantages of the old small dial of which Mr. Nyedegger has sold so many. Hosiery manufacturers who are interested are invited to bring or send their own goods to have them looped or finished on the machines.

Kaumagraph Company, 156 Sixth Ave., New York, proprietors of the Kaumagraph process of stamping hosiery, underwear and other fabrics, give an actual demonstration of their process in their space. Liberal supplies of samples will be furnished to manufacturers and the simple working of the process is shown to visitors.

E. Jenckes Manufacturing Company's exhibit consists of four Invincible machines, two of them being 240 needles, 3 3/4 inches

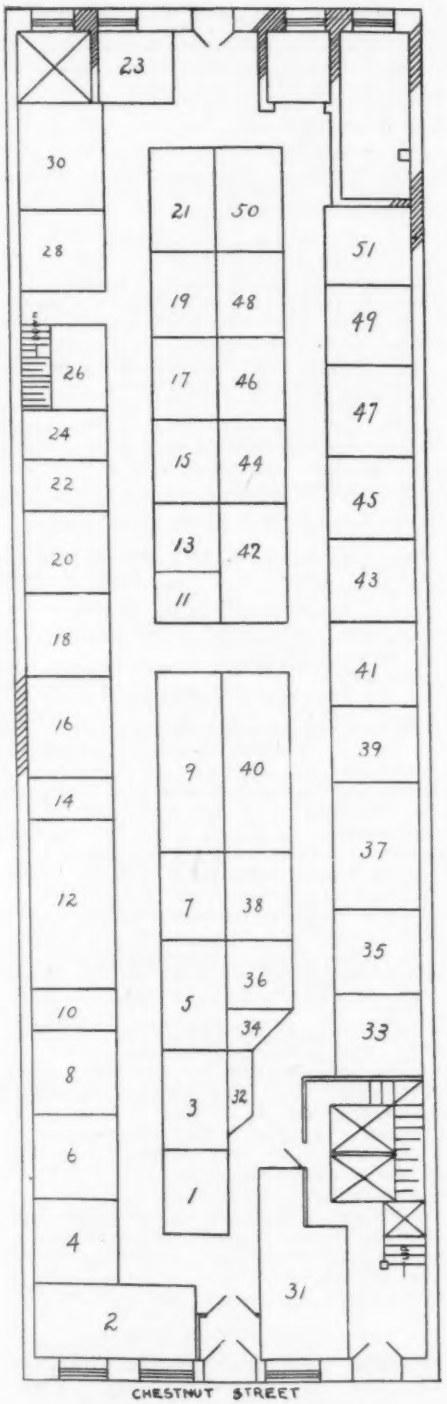


DIAGRAM OF EXHIBITION HALL.

diameter, equipped with various attachments, such as high spliced heel and double sole and garter top, etc. They also show a 260 needle, 3 3/4 inch and one 200, 3 3/4 inch. The fine gauge machines are of special interest as they represent the type of machines which this company has sold in such large numbers.

Hemphill Manufacturing Co., Pawtucket, R. I., has four of the Banner automatic knitting machines on exhibition, each one on different work, namely: One 220 needle, 3 3/4 inch, on ladies' high splice and double sole, one 176 needle on ladies' black leg and white foot, one 200 needle on half hose high splice and double sole and one 160 needle on half hose plaited. The simplicity and high character of work done on the machines has won for them many friends.

The New England Cotton Yarn Company has an attractive display of the great variety of their product which is of special interest to knit goods manufacturers. The yarn market is of vital importance to the trade at the present time, and there is no danger of manufacturers getting out of touch with the situation with the facilities at hand in Philadelphia.

Singer Sewing Machine Co. has a large space to be occupied with a variety of machines adapted to the knit goods trade. They expect to demonstrate by actual operation.

Salvator Transfer Co. shows in its space pictures illustrating their extensive and well equipped teaming outfit with which they handle the goods of many textile manufacturers in New York City. Having made a specialty of this line of business they know just how to take care of it.

The George D. Mayo Machine Company, Laconia, N. H., has a space on the main aisle which is fitted up as a reception room and headquarters for their friends and representatives. As their own Philadelphia office is so near the exhibition rooms, namely in the Knickerbocker Bldg., corner of Sixth and Arch Sts., they do not have any of their machines in operation, but manufacturers are invited to see them at their own office.

The "Hurricane" stocking drier, built by the Philadelphia Drying Machinery Co., which exhibits in space No. 2, contains improvements over older types, the fan shaft bearings being located entirely on the outside of the drier, and being of the ring-oiling pattern. The drawers are made of steel angles, securely riveted together, and as they run on roller bearings, are easy to operate and practically indestructible. Their "Hurricane" presses are built with steel housings giving most rigid construction. The method of transmission has been improved, eliminating the greater portion of friction and requiring less power. Their sulphur dyeing machine is built entirely of iron and steel. The reversing motion is entirely automatic and very positive in its action. They have a very complete line of large photographs showing different styles of dyeing, drying, bleaching and finishing machinery, presses, etc., which they build.

The International Sprinkler Company of Philadelphia show the various appliances manufactured by them in the way of sprinkler heads and sprinkler service. Various models and pictures of buildings showing installations give a good idea of their equipment and the large number of textile mills which have adopted this system.

Standard Machine Company, Philadelphia, exhibit one of the latest types of standard "F" knitters. The machine is equipped with the latest attachments and devices, making it a complete automatic machine. Over 11,000 machines are in operation at the present time. At the offices and works of the company which are now located at 12th and Callowhill Sts., all the different models may be seen in operation and full particulars obtained.

Jacob K. Altemus, 2816 North Fourth St., Philadelphia, has on exhibition his new hosiery winder for skeins, and also a winder for back winding pieces or cones. Manufacturers will be interested in a special machine that he exhibits for winding yarn as fine as 60s to 80s, which is beyond the capacity of the ordinary machine of this type. Owing to the lack of space he is unable to show his stamping machine for hosiery, but invites interested manufacturers to call at the works and see it in action.

John W. Hepworth & Co., Philadelphia, exhibits the Hepworth loopers, which are so well known in the trade. The latest models are shown and representatives are present to explain fully their operation and give any information desired.

James Taylor, Philadelphia, shows in his interesting exhibit the new ribber which is described in another part of this issue. He also exhibits a special machine for knitting neckties. This latter machine is of special interest at the present time as these goods are much in demand and manufacturers making them have done good business. He has, besides, a body frame for ribbed underwear and a sleever.

Harding & Fancourt, 235 North Front St., Philadelphia, whose interesting exhibit at the last convention will be remembered, are again exhibiting this year as they found that knit goods manufacturers were interested in their special products for softening and finishing. Their Tuscan softener is widely used for fast black dyeing and for finishing. Franco is another of their products which is used in the boiling out of cotton to prevent discoloration, and to remove oil and kier stains and leave the goods stronger and softer. Soldine is a soluble oil which is used in a dye bath, which saves the necessity of boiling out cotton before dyeing. Besides these specialties and others, they handle all grades of Turkey red oil, olive oil, sodas, etc.

One of the exhibits at last year's exhibition which created marked attention from the visitors to the convention is again on show this year. The Beckert Needle & Supply Co. exhibits a large case of needles of all kinds used in knitting, gotten up and designed in a most artistic manner. This exhibit is the same as that shown at the Paris Exhibition held a few years ago and was shipped to this country expressly for the knit goods exhibition in order that the manufacturers in this country could see exactly what class of goods this concern produces in their large factories abroad. Their offices are at 4921 Green St., Germantown, Philadelphia.

The Nicetown Dye Works, Westmoreland and C Sts., Philadelphia, have a space in which they will demonstrate by showing samples and telling how it is done, why "Hagar's intense black dye" saves darning and wears longer than some of the other processes now on the market for the dyeing of hosiery and yarn.

Paxton & O'Neill, 537-39-41 North Third St., Philadelphia, believing that an exhibition of the goods produced on their machines would be a better demonstration than that of having machines in operation, have on exhibition a line of samples of the different kinds of hosiery which their machines are capable of turning out and invite manufacturers to call at booth No. 6 and look them over. They are builders of automatic knitters.

Spaces number 17 and 19 contain an exhibit of interest to manufacturers who are doing their own dyeing or are contemplating the installation of machinery for doing such work. Messrs. Stevenson & Muthart, 854 Penn St., Reading, Pa., have on exhibition their new singeing machine which they claim is a time, hose and money saver, equipped with an automatic gas saver, doing away with leather belts, and enabling the operator to feed the boards from the top instead of the toe, as has been the custom heretofore, and last, but not least, see the counting device which enables the operator to see at a glance just the number of hose singed.

Cheney Brothers have selected from their novel industrial exhibit recently made at their own works in South Manchester, Conn., which attracted thousands of visitors from all over the state, such of their products which would be of special interest to the knitting trade. They manufacture all kinds of spun silk yarns, dyed and printed, as well as knitting silks, ribbons and piece silks used for trimming knit goods.

Credit Office, New York City, use their space as headquarters for their representatives. During the last few years this concern has made a specialty of reporting mercantile creditors for the knit goods trade and have had the endorsement of the Association.

New York Silk Conditioning Works make

an exhibit which illustrates the work that they do for all kinds of textile manufacturers in testing cotton, woolen, worsted and silk yarns, and making certified reports of condition including moisture, strength, etc.

L. J. Wing Manufacturing Co., New York, have a space to show their product which includes ventilator apparatus, fans, etc.

The Textile Manufacturers' Journal uses its space as headquarters for its representatives and reception room for their friends.

The exhibit of the Manufacturers' Supplies Company consists of an attractive display of latch needles, sewing machine needles, looper needles, belting, round and flat, as well as general supplies for use in knitting mills, of which they carry a very large and complete line.

Lord & Nagle Company, publishers of the Textile World Record and American Directory for the Knitting Trade, Official Directory, etc., has a well located space, No. 38, on one of the main aisles, where its various publications are shown, and where orders may be given. Their representatives are in attendance to welcome friends.

Diehl Manufacturing Co., Elizabethport, N. J., exhibits a line of motors and generators and fans. Several of the exhibits are operated by their motors.

The American Drying Machinery Co., 19th and Westmoreland Sts., Philadelphia, will exhibit a hosiery drier, an automatic stocking turner, ventilating fans, a chroming machine. The hosiery drier is claimed to be absolutely fireproof, being built of compressed steel throughout.

The Ideal Hosiery Printing Co., 125 East Herman St., Germantown, Philadelphia, make an exhibit of samples of hosiery dyed, printed and extracted by them under new and up-to-date methods for this line of work.

Manufacturers who were much interested last year in the power top cutting machine manufactured by the Robinhold Machine Co., 850 N. 8th St., Reading, Pa., will note that the company again occupies a space where they exhibit this successful top cutter which has been equipped with appliances which make it even better than before. An attachment can now be used which piles misses' and children's tops in dozen lots after being cut, thus keeping them in good order.

Smith, Drum & Co., 2503-9 Coral St., Philadelphia, display consists of several of their latest improved machines. They will have on exhibition one of their improved rotary dyeing machines, a circulating dyeing machine, a singeing and stripping machine, air compressor and a mercerizing machine.

Berlin Aniline Works occupies space No. 1. No visitor can get by this location without noticing their attractive display in which they exhibit products dyed with their colors, and where their representatives are on hand to give a welcoming hand and all desired information to visitors.

Roessler & Hasslacher Chemical Co. has its old space near the door. Their business concerns one of the most vital questions of interest to knit goods manufacturers, namely, a good bleach. They understand this business both from the scientific and practical standpoint, and their staff of experts is familiar with the problems which concern knit goods manufacturers, and is competent and willing at all times to visit the plant and give advice and directions on the spot.

Merrow Machine Co.'s exhibit occupies a prominent space, No. 3, where manufacturers can see the work done on their machines and the character of the product. They build overseamers, trimmers and shell stitch machines for finishing underwear.

Mayo Knitting Machine & Needle Co. use their space as a reception room to meet their customers and all who are interested in their line. They also exhibit samples of the goods produced on their machines. The machines themselves can be seen in operation at their Philadelphia office in the Knickerbocker Bldg., Sixth and Arch Sts.

Nonotuck Silk Co., of Philadelphia, have an attractive exhibit of silk in all forms for knitters' use.

The National Association of Cotton Manufacturers

The annual meeting of this association was held in Huntington Hall, Massachusetts Institute of Technology, Boston, Mass., on April 16 and 17. Secretary C. J. H. Woodbury presented the following report:

The Secretary's Report.

The additions to the membership have been greater during the past year than that of any in its history, with one exception; but the numerical increase in membership is not a full measure of its growth because the influence resulting from the force of larger numbers applies to a wider scope, and has imposed upon this organization certain added duties and even responsibilities in respect to the interests of its members.

It has always been the policy of this Association to attend to such needs even to the smallest details, as an organization must be managed upon such a policy that membership in it will be distinctly advantageous to those who are competent to be of its number.

A careful tabulation of the relations of each of its members as indicated by their positions was made last summer and showed that a majority were in positions whose responsibilities were upon the financial side of cotton manufacturing, and this was without any diminution of their duties pertaining to the technical side of the industry.

The growth of the industrial unit and the competitions of more extensive lines of manufacture, and also those of wider markets, have increased the responsibilities of those in charge of such establishments, particularly in connection with systematic methods of organization without which the management of a large mill would involve duties beyond the physical strength or the mental capacity of any one individual.

At the initiative of this Association, the American Association of Cotton Manufacturers, the Southern Cotton Association, and the Farmers' Educational and Co-operative Union joined in calling for a Second International Conference of Cotton Growers and Manufacturers, which was held at Atlanta, Georgia, in the Hall of Representatives on October 7 and 9, 1907. At this meeting was one hundred and eighty European cotton manufacturers and their guests, also representatives from the Boards of Trade and other commercial organizations throughout the cotton producing states.

In accordance with the vote passed at this Conference asking that each of the associations appoint two delegates to the Executive Committee of the Conference, the President and Secretary were appointed by the Board of Government, ex-officiis, with power of substitution. The English Federation of Master Cotton Spinners' Associations, Limited, and also the European Continental organizations represented in the International Federation of Master Cotton Spinners' and Manufacturers' Associations have not as yet appointed any delegates and the matter has been left in abeyance until their meeting to be held in Paris, June 1, 1908, shall take up the question. The invitation that this Association should send five delegates to the meeting in Paris has been accepted by the Board of Government, which voted that the President should select the delegates.

THE ASSOCIATION MEDAL.

The Association Medal for the year 1907 was awarded to Charles B. Burleigh, of Boston, Mass., for his paper on the Curtis Vertical Steam Turbine.

THE STUDENT'S MEDAL.

The Student's Medals for the encouragement of textile education, which is supported by a fund donated for that purpose by the late Moses Pierce of Norwich, Conn., in commemoration of his ninety-second birthday, July 3, 1900, have been awarded during the year to Lloyd L. Delano, New Bedford, Mass., a graduate of the New Bedford Textile School; James Groesbeck Coman, a graduate of the Lowell Textile School; Theodore Eckhardt Raht, 710 Prospect Street, Chattanooga, Tennessee, a graduate of the Textile Department of the Georgia School of Technology; Joel Robert Baker, 150 East Fourth Street, Oswego, New York, a graduate of the Philadelphia Textile School.

THE FIRTH SCHOLARSHIP.

The scholarship established by the Association from the contribution of William Firth, Esq., sustains a student at the New Bedford Textile School. The present recipient of this scholarship will graduate in June, 1908, and the income will be available for the education of another student which, under the conditions of the deed of trust establishing this scholarship, is to be given preferably to the son of a member or of a deceased member of this Association. The Association gives this as a notice that it is ready to give information of detail respecting this scholarship and invites applications for the same.

The Association medal was awarded to Charles H. Fish, Dover, N. H., the committee having the matter in charge having decided that Mr. Fish's paper on "General Questions of Cotton Mill Fires" was the best paper read at the previous meeting. Addresses of welcome were made by Arthur A. Noyes, Ph. D., President of the Massachusetts Institute of Technology and by Acting Governor Draper. President Hartshorn of the National Association then delivered the following address:

President's Address.

BY WILLIAM D. HARTSHORNE, Lawrence, Mass.

One of the most important events in the past six months which our panic conditions unduly overshadowed was the Atlanta Conference. It was earnestly felt by those who took part in this Conference that it was an epoch-making event. The

meeting together face to face of rival interests, and the formulating of resolutions covering so many details in regard to the cotton growing industry and the trade relations governing the same, where it was necessary for absolute unanimity to carry any resolution, was a noteworthy achievement. Manufacturers from the United States, many from across the water and representatives from the cotton exchanges met the planter upon his own ground and it is to the credit of the planter that he acknowledged without cavil the handicap which faulty methods had placed upon the cotton growing industry and which was reflected back against him by the serious results to the cotton spinner. Some of the methods of the cotton exchanges received the strongest condemnation of both spinner and planter, but against efforts to legislate exchanges out of existence, wiser counsel prevailed.

It is to be regretted that the matter of permanent organizations has so far hung fire, only a few of the associations represented having appointed delegates. The first set-back came from the British Master Cotton Spinners' Association, a branch of the International Federation, who claimed that to multiply organizations would not be of benefit to the industry, their efforts being confined to endeavors to unite our manufacturing industries on this side of the water with the International Federation. This would seem practically impossible of attainment, even in a very limited way. Not all the interests of our manufacturers are by any means identical with those of our European friends, and it would seem that the only kind of unity of interest would be such as could be represented in periodical conferences, which it was the object of the permanent organization to foster and maintain. Possibly this matter may be taken up more advisedly at the European Conference at Paris wheih meets June next, and to which our Association has appointed five delegates, whom we trust will be able to return to us with valuable information there acquired.

One of the natural questions arising from the participation of the various Associations in this Conference at Atlanta is, how far our Association can unite its efforts with others in taking official action upon other matters than those simply technical? The Board of Government has been approached several times upon numerous subjects relating to legislative matters, but in which it seemed to them it was not within our province to take part. It must be remembered that we are an association of individuals and not of corporations or firms, and it has been our policy to avoid any entangling alliances which would in any way affect, either for good or ill, the financial policies of our several corporations. That it is possible, however, for us to make our influence felt, where it is proper to do so is evident in the efforts which have lately been made, under the sanction of the Board of Government, to bring reliable evidence before the House of Representatives in regard to the great importance of preserving our rapidly diminishing forest reserves. At our annual meeting in April, 1906, resolutions were passed, and were made use of in this campaign, which is still in progress, towards effective legislation by Congress and at a hearing before the Committee on Agriculture at Washington, on Thursday, January 30, we were officially represented by our Secretary, C. J. H. Woodbury and such manufacturers as F. C. Dumaine, Hon. Arthur H. Lowe, James P. Tolman, and others, in such a way that the commercial side of this matter, as effecting the water power of our mills, was for the first time brought clearly to the attention of our legislators, and it is to be hoped that the individual efforts of each member of our Association, as suggested by a circular recently issued, will bear fruit. It should be remembered that this important measure, upon its own intrinsic merits, has twice passed the Senate, but for lack of something more than formal resolutions, has failed of recognition in the House. Resolutions which are not backed up by intelligent co-operation of individual effort are not likely to get or keep the attention of either law making or executive powers.

WM. D. HARTSHORNE, THE RETIRING PRESIDENT OF THE NATIONAL ASSOCIATION OF COTTON MANUFACTURERS.

A subject upon which only our individual efforts could be employed was in reference to the Gardner Bill, of which you all no doubt have received official information. It is possible that one of our most effective ways of usefulness to the trade in general can be developed along the lines of spreading information to our members for their individual action, as has been done in reference to this particular bill. It is certainly desirable that the influence of our Association upon all matters of interest to the trade, not strictly confined to financial management should have an opportunity for recognition.

The question has been asked: What should be the attitude of this Association towards the seeming causes for our financial panic? So far as they

are political, or relate strictly to the merchandizing side of the industry, we cannot, of course, take any united action, but even as individuals it may be worth our while to reflect whether we consider that antagonism to evil conditions, or the evil conditions themselves have been the principal factor in bringing about our unpleasant situation. It may be assumed as axiomatic that without the evil conditions, efforts to overcome them would not have been required, and while it may be the part of wisdom to act with discretion, the element of valor must not be left out. It is evident that the people are not inclined to regard the house-cleaning efforts of the so-called big stick as responsible for the dirty house. On the other hand, those who are responsible for great financial undertakings are disposed to ask the question if in this effort to clean house it was necessary to raise such a terrible dust, spreading disease and disaster in its train. But regrettable and dangerous as this dust may be, has it not been blown away by the moral awakening of the nation? The primary confidence required for financial success lies with the people. Has not the knowledge that wrongs exposed (and perhaps yet to be exposed) will be righted under the full power of the law, been a great factor in preventing a total collapse of this confidence now happily restored?

As regards the textile industry in general, and the cotton industry in particular, there is nothing to be said from a technical point of view, except to improve the opportunity for betterment of all mill conditions, and to keep courageously at work to this end.

The change of conditions of business since our meeting in Washington is certainly remarkable, and while the financial stress appears to be over, its after effects are far from complete adjustment, and the efforts to maintain marketable conditions by curtailment of production and reduction of wages seem for the time to be unavoidable. The lowering of the purchasing power of the laborer throughout the United States may have a temporary effect to further diminish the demand for goods, for which a diminution of supply is the economic offset. The insufficient supply of work is already returning to foreign shores many of those who have emigrated here: a temporary blessing, perhaps, for the distress of the unemployed in some of our cities is already serious. It is certainly incumbent upon every industry to act soberly and cautiously, but with a full degree of optimistic expectation.

Speculative efforts to raise the price of cotton in the face of the diminished demand have been meeting the natural result of such efforts, but a reaction to materially lower prices in cotton may not necessarily be an advantage to the cotton manufacturer, for its effect is discounted by the buyer, and this greatly increases the difficulty of maintaining contracts yet to be delivered.

All these relations, however, are ultimately readjustable, just as rapidly as confidence between buyer, seller and banker, and the general public can be fully restored, and possibly we as manufacturers will be soon welcoming back to our shores again, perhaps more greatly needed than ever, those whom we are now unable to keep employed.

In this matter of recuperation we must not forget that a great indebtedness is to be due the farmer, who supplies the main necessities of life. His purchasing power may be lessened by the general condition of the country, but he feeds the world, and he has had, and is likely to have, the necessary supply. As long as the farmer can be depended upon for this, no long depression seems possible, and we have a right to expect a future development for our whole country upon a firm basis of success, firmer perhaps than heretofore, because of the awakened sense of moral obligation: a cultivated inheritance to the many, but compelled to the few.

Steam Turbines for Textile Mill Power.

BY MELDON H. MERRILL, Boston, Mass.

In the successful operation of any power system, the prime mover is, of course, but one factor contributing to its success, and, before the final results may be observed in the character and quality of finished product, several other factors intervene, any one of which serves to limit the effectiveness of the system as a whole. Thus, in cotton mill work, boiler plant, generating plant, distribution system and induction motors, all intervene as factors in this complete problem. They are coexistent with, and yet independent of the prime mover. But, in spite of this fact, it is true that, after all, the prime mover calls for perhaps the largest share of consideration. There may be some difference of opinion upon this, but there remains the fact that the modern system of electric distribution by motor drive, has been developed to a state of such efficient and reliable service as to relieve us from any extended consideration of this subject for the present. Moreover, electric distribution is becoming very largely standardized, which cannot be said to apply to the steam power plant, except as regards a particular type of apparatus.

It is, therefore, assumed at the outset that the electric system of power distribution has reached a state of perfection such as to merit your serious consideration and ultimate adoption. The comparative merits of motor versus rope dripe, therefore, have no place in the present discussion. And, as the most effective application of the reciprocating steam engine is in connection with direct rope drive, we are, therefore, brought to a consideration of the turbine as a prime mover, either hydraulic or steam, excepting in locations where the price of fuel favors the adoption of the gas engine.

In order to form a dispassionate and unbiased opinion of the intrinsic merits possessed by the steam turbine for cotton mill work, how shall we best approach the problem? The field of observation is comparatively narrow, there being but two principal types on the present market which can be considered as developed. Shall we, on the one hand, give ear, up to the limit of our patience, to the man who proclaims a monopoly upon every conceivable advantage under the sun, and out of a hopeless, confused mass of exaggerated claims and unfounded assertions, endeavor to extract a modicum of truth by process of elimination, or shall we "take the bull by the horns" and go straight to the fundamental facts which underlie all successful development?

And what are these? Naturally, the matters of greatest concern to the cotton mill operator, are:

First, reliability; for many different processes depend upon the continuity of service from the power plant. That simplicity in operation is one of the most impressive features of the steam turbine is true, but a secondary consideration. Second, uniformity of speed. Here the turbine stands predominant in the entire absence of cyclic speed variation, due to the absence of reciprocating motion, which, even with a perfected steam engine, requires such careful consideration. This is of particular importance in cotton mill work, as any variation in speed affects directly the productive capacity of the plant.

Third, economy, not alone of fuel, but in all attending expenses, foundations, space, supplies, maintenance, attendance and fixed charges on the investment.

Now these three factors practically constitute the basis of your ultimate judgment, but an adequate consideration of all these matters is, of course, outside the scope of any one paper. We will, therefore, narrow down our inquiry to the construction of the prime mover, the design of which allows the complete fulfillment of the predominating features just outlined, and, although I shall strive to avoid wearying you wtih unimportant detail, yet I cannot help but feel that your final judgment will bear me out, that the kernel of the solution lies in these same details.

What is to follow deals largely with recent improvements in construction, all of which have an important bearing upon reliable and efficient running and for the reason that the Parsons turbine principle has never been adequately presented before this Association, I have purposely covered some details which might otherwise have been omitted. By necessity, some comparative references to intrinsic features of other designs are made, but this is avoided as much as possible.

Westinghouse Turbine Development. By way of introduction, it is well to briefly summarize here the extent of turbine development recorded since the beginning of active operations at the Westinghouse plant, East Pittsburg, in 1899. At the close of the year 1907 there were entered upon the records a total of over one and one quarter million horse power in turbine machinery; three-quarters of a million horse power was at that time in operation or under erection, and the balance in various stages of manufacture for order and stock. Between the years 1904 and 1908, the turbine production has more than doubled each year, and, with this rapid development, it is gratifying to note that the textile mills lead all other industrials, and relatively compares very favorably with traction and lighting plants. This is particularly interesting owing to the fact that the majority of textile installations to date have been additions to existing steam engine plants.

The lesson this great development in turbines possesses for the cotton mill engineer is that the accumulated experience acquired by the builders is embodied in the present design, which is a most valuable asset in his favor. Furthermore, the fact that nearly all Westinghouse turbines (well over 90 per cent.) are paid for within three months of completion of installation, furnishes an effective commentary upon the general satisfaction which prevails among turbine users. We will now consider the specific points of design.

Principle of Operation. Like the hydraulic turbine, the steam turbine is simply a mechanical means of transferring to a rotating bucket wheel the kinetic energy of a rapidly moving fluid jet. These principles have already been outlined in sufficient detail in previous papers before the Association. One fact, however, has not been made sufficiently clear, viz: that, with high velocity steam, mechanical erosion of all metal in contact with the steam, is bound to occur, especially with steam containing entrained moisture. Realizing the difficulty of constructing turbines of the single-wheel impulse type, possessing the desired strength, high efficiency and long life, Mr. Parsons finally developed the multi-stage expansion turbine. In this system, the steam is only partially expanded in each row of blades, i. e., the energy of the steam is removed step by step. Hence the bucket and jet velocities need be but a fraction of those necessary in the single-stage turbine, and it becomes possible to construct commercial machines of high economy and operating at comparatively low bucket and shaft velocities. The Parsons multi-stage turbine may be classed as embodying the combined impulse and reaction principle, i. e., the steam acts upon the moving blades partially by impulse and partially by reaction.

Turbines of this type are already operating in the field up to 7,500 kilowatts capacity, and several machines of 10,000 kilowatts are either under erection or building, for the Kent Avenue Station of the Brooklyn Rapid Transit Company, New York, one of the largest stations in the country and exclusively equipped with Westinghouse turbines. These machines represent the largest single turbo units ever constructed for power work, and will have a guaranteed over-load capacity of 22,000 brake horse power, which would be equivalent in the reciprocating engine, to an output of 25,000 indicated horse power. It is unnecessary, however, for the purposes in view, to consider the special construction of these large units. In Fig. 4 a turbine is shown with some of its parts removed for inspection. This view should be studied in connection with Figs. 5 and 6. These three views speak volumes for the man who thinks it worth while to inspect his machinery at intervals.

Stator. Briefly, the turbine consists of two parts, the stator or cylinder and the rotor or spindle. The stator is built in two parts, as shown, the upper carrying the admission valves and distribution passages, the lower cast into two pedestals. At the exhaust end the cylinder is anchored to a rigid, continuous bed plate, while the outer pedestal is permitted to slide between guides, thus providing for expansion and contraction of the turbine along its axis. Inasmuch as no live weight comes upon the cylinder corresponding to the moving weight of the reciprocating engine piston, the structure is simply that of a cylindrical envelope carrying its own weight from two supports. The cylindrical section gives the most rigid structure and avoids entirely any allowance for sag or vertical deflection.

Rotor. For a similar reason the spindle is built up from a hollow central shell, into which are fitted slide shaft ends forced into place and retained by shrink links. This allows a light but rigid structure in which the sag is practically negligible.

In spite of this fact, the horizontal design of turbine has been unjustly criticised as being greatly affected by sagging between bearings; a practically non-existent factor. The rotor is not built in one piece, but consists of a number of sections threaded in succession upon the spindle. Each section is not only balanced individually, but also the entire spindle after completion, so that the effects of unsymmetrical distribution of metal are brought to a minimum.

Owing to the relatively minute pressures actually exerted upon each individual blade, the most desirable characteristics of a Parsons blading material, are not maximum physical strength, but rather ability to withstand high temperatures without deterioration, and the corrosive effect of impure water. Moisture always occurs at some point in the expansion of steam, even if super-heated, hence, toughness is to be desired in the blade. Several materials have been successfully used in Westinghouse turbines, viz., bronze, steel and hard copper. None of these materials combine all the desired physical characteristics to be universally applicable. With pure water, steel has unquestionably proven an excellent material. With corrosive water, bronze or copper has been used to better advantage.

In the last year, however, a special material, known as duplex metal, has been developed, and is now exclusively used in Westinghouse turbines. This material is manufactured by a secret process and combines the structural strength of a steel centre with the protective qualities of the copper sheath. The two metals are welded so perfectly that the material can be drawn to the required blade section without altering the thickness of the sheathing. This copper sheath provides great resistive qualities against chemical erosion without altering the strength of the blade.

In the Parsons type, two methods are in general use for governing the admission of steam according to the load. In one the steam supply is simply throttled so that the inlet pressure varies with the load. In the Westinghouse system, steam is admitted in puffs of approximately full pressure and occur at regular intervals. The duration of the puff, however, is controlled by the governor according to the load, by allowing the valve to seat sooner or later, as the case may be.

As in all engines of high speed, some form of safety stop is desirable to check the speed should the turbine governor become inoperative through neglect or damage. Positive action is secured by mounting the stop directly on the end of the turbine shaft, thus avoiding belts and gears. The tension of the plunger spring is adjusted by a guide bushing. As soon as predetermined overspeed is reached, usually about 7 per cent., the projecting plunger trips a small valve which releases a quick closing throttle in the steam line. Once set, this speed limit cannot change adjustment, and it is only necessary to trip the throttle by hand occasionally to keep it free and in good working order.

From the standpoint of reliability, this detail of the turbine is of grave concern to the operator. In the Westinghouse design two principles are rigidly adhered to: First.—Bearings of ample proportion to carry weight of rotor without resort to forced lubrication. Second.—Continuity of oil supply dependent only upon the turbine itself and not upon independent auxiliaries. In spite of protestation to the contrary, past experience has proven that we must not allow the least outside interference with the integrity of the lubricating system: in other words, turbine and oil pump must run together. These principles can best be embodied in a horizontal design of turbine, and past experience has fully justified the attitude of Parsons turbine designers. Third.—The oil pump of the simple plunger type is driven directly from the turbine shaft by a worm gear. Hence, so long as the turbine runs, the bearings will receive oil. Fourth.—No forced lubrication is employed, simply a static head of one or two feet, from the reservoir. This head is just sufficient to thoroughly flush the bearings.

The bearing and lubrication system of this turbine is the result of an elaborate series of experimental tests on various lubricants and metals conducted for several years on full-sized models suited to a machine of 10,000 kilowatts capacity. The bearing tests were in each case carried out to a point of failure, and the results indicated a large margin of safety in the present bearing proportions.

It is a well-known fact that, even after several years' service, the original tool marks may be found on these bearings, which speaks for itself. It has never been found necessary to fit removable sleeves to the shafts of Parsons turbines in order to localize the damage due to bearing failure.

In the direct connected turbo generator may be found the most important factor limiting the general design of the turbine itself. At standard frequencies, the number of running speeds possible is reduced to comparatively narrow limits, viz. 3,600, 1,800, 1,200 and 900 revolutions per minute for 60-cycle service and 3,000, 1,500 and 750 revolutions per minute for 25-cycle service. Fortunately, the turbo generator design permits of high running speeds without incurring disadvantages in loss and mechanical strength.

Outside of its small dimensions, the turbo generator follows the standard design of alternating current apparatus, so that we need consider but two points. First.—The rotating field in the smaller sizes consists of a solid cylinder of steel with copper strap windings imbedded therein, so that the field presents a smooth cylindrical surface which greatly reduces the loss from air friction. The ends of the field are capped by non-magnetic material into which the end of the field shafts are forced under hydraulic pressure. Second.—The ventilation of the generator is mechanically provided for by means of ventilating fans mounted upon the field shaft, as shown in Figs. 4 and 16. Here one-half of the air chamber fitted to each end of the generator has been removed to show the fan and winding.

Air ducts beneath the turbine communicate with these fans and it is well to note here that whatever the temperature of the engine room, the generator is always supplied with a positive draft of pure, cold air from the outside. This positive ventilation is, perhaps, the most important feature of the Westinghouse turbo generator and is responsible for the high over-load capacity shown by this machine. For example, during a serious accident occurring last year at the Waterside station of the

New York Edison Company, a 7,500 kilowatt Westinghouse-Parsons turbine sustained practically the entire 60-cycle load, of from 13,000 to 14,000 kilowatts for one hour and twenty minutes. This corresponds to an overload of practically 80 per cent., while the machine is usually guaranteed to sustain 50 per cent. overload for one hour.

Before closing the subject, it would be well to take a general survey of the turbine situation as outlined above in detail, keeping prominently in mind the three important factors selected at the outset as the basis of our inquiry, and the advantages of this type of prime mover for textile work.

First, we have a machine that is entirely self-contained, and whose operation is not continually jeopardized by the danger of injury to independent auxiliaries.

Second, one that may be dismantled and reassembled for service within an hour; in which only the covers of bearings and cylinder need be removed in order to lift out the entire rotor, instead of going through the laborious process of dismantling piece by piece a built-up structure.

Third, a natural force, capillary attraction, supports the rotor weight without forced lubrication or wear; not an artificial means in which the turbine has no control over its supply of oil, and only a few moments intervene between success and failure. Only this has made it possible for a Parsons turbine to run 17,200 hours without stopping.

Fourth, a generator protected from heat radiated from a turbine, steam leakage from glands, oil drip from bearings and variation in room temperature; one that is noiseless in operation and positive in ventilation, all of which insure long life.

Fifth, a system of steam distribution in which the mechanical difficulties of high velocity have been overcome by simple, sub-divided expansion, entirely avoiding wear on moving or stationary blades; with a blade construction possessing ample resistance to stress and chemical action, yet capable of relieving locally any emergency condition arising from excessive temperature strains or other causes.

Sixth, we have a prime mover sensitive in speed variation to an unprecedented degree one per cent. or less within normal ranges of cotton mill load, which insures a maximum production and always under the instantaneous control of the governor, not controlled in successive steps, requiring the turbine to "straddle" the load, as it were.

Seventh, by the addition of a single valve, we have provided enormous forcing capacity entirely beyond the range of a belt or rope drive, which will enable us to "pull through" what would otherwise constitute a serious emergency.

Eighth, once proven in ship economy tests, we have a standard for future comparison; with adjustments locked in normal working position, the economy should remain unchanged except through actual damage: and with the economies of small units so close to those of larger ones, it is possible to sub-divide power into several units, a most valuable security against manufacturing interruptions.

Ninth, by extreme compactness we have reduced not only floor space and head room, but also general construction costs and fixed charges thereon. This offers a very attractive feature in that turbines may frequently be used in existing power houses to care for an increased demand of power. I have in mind a cotton mill where a 1,500 kilowatt turbine unit has been erected on one-half of existing foundation of a 1,200 h. p. cross compound engine, there being sufficient space left to erect another unit of a similar size, giving a total of 4,000 h. p. capacity on a foundation formerly required for 1,200 h. p. Condensers, either surface or jet, are being installed beneath the turbine in the foundation, thus eliminating all bends in the exhaust piping and extra space for auxiliaries. In the Fort Wayne Central Station, turbines are located on the second floor of the power house, supported only by latticed columns.

Tenth, and finally, the whole subject of the comparative advantages or disadvantages of the steam turbine is well brought home by this fact: that two 500 kilowatt turbine units were put in operation at the power house of the Cleveland Electric Illuminating Company, 74 1/2 hours and 47 1/2 hours, respectively, from the time the machines left the shops at East Pittsburg. The last machine was actually erected in 13 hours straight work.

It is hoped that the above features will serve in a measure to explain the construction and operation of the Westinghouse, Parsons Turbine Unit, and also indicate the advantages accruing from the use of this type of prime mover, as applied to the textile industry.

The Need and Advantages of a Cotton Exchange in New England.

BY JAMES R. MacCOLL, Providence, R. I.

In an address delivered a year ago to this Association, I referred to the advisability of establishing a Cotton Exchange in New England. The suggestion called forth many comments and criticisms. The latter were, to a large extent, based on a misapprehension as to the purposes and methods of such an institution. To many minds a Cotton Exchange is associated with so-called gambling in futures, and therefore, it is not wanted in New England. The object of this paper is to explain more fully my views regarding the organization and work of an exchange adapted to the present requirements of manufacturers and merchants in this vicinity. The best model for us to follow is the Bremen Cotton Exchange, the membership of which is composed jointly of spinners and merchants, the former being in the majority. This differs radically from the New York Exchange, in which membership and management are confined to cotton merchants, and from the Liverpool Exchange, in which spinners are admitted only as associate members. In England there has recently been much criticism of the existing arrangement, which permits only two spinners to represent their interests on the Board of Directors, while the cotton dealers have a representation of fifteen.

In Bremen the union of the two interests has been attended with marked success and satisfaction. In addresses delivered at the Bremen Congress of the European Federation in 1906, Herr Plate, president of the Exchange, said:—

"It came to us as an inspiration that the only way to combine these two interests would be to put them together in such a way that the one should control the other. We found that there was no possibility of gaining confidence with our spinners, nor did our spinners believe there was a chance of gaining confidence with our dealers unless a system was arrived at which would produce the combination actually created in the Bremen Cotton Exchange, where spinners and dealers work together under peaceful conditions and in a most efficient manner.

"The number of spinner members in our Cotton Exchange is more than double the number of our dealers, and that will enable you more than anything else to exactly understand what we have arrived at. I confess I never heard of any combination between trade and industry similar to this, the Bremen Cotton Exchange.

"I feel certain that the more you enter into the details of the system that obtains in the Bremen Cotton Exchange, the more you will find that we have, after severe strife, arrived at a solution which seems perfect."

Herr Cramer, vice president of the Exchange, said:—

"Thus it came about that the industry also strongly desired the establishment of a large cotton market in Bremen, and in 1886 the Bremen Cotton Exchange was founded.

"The close union between cotton merchant and spinner which was created by the Cotton Exchange was a means of placing the cotton trade on quite a different basis."

An extract from a recent report of the Bremen Exchange also emphasizes the same feature:—

"The following figures are a striking proof of the harmonious and loyal co-operation of both branches of the trade.

"While in the year previous to the joining of spinners to the Bremen Cotton Exchange 430,000 bales were imported, and 151,000 bales arbitrated. In the following year, 1887, the import rose to 658,000 bales, and 300,000 bales were arbitrated. Ten years later, 1897, the import amounted to 1,400,000 bales and 1,090,000 were arbitrated."

In the year 1907 the import reached 2,141,754 bales, and 2,396,128 bales were arbitrated, the difference we presume being accounted for by imports of the previous year receiving arbitration in this period.

The first point that I make is that we need in New England a Cotton Exchange in which merchants and manufacturers shall work unitedly for the development of the industry, and together shall establish rules of trading, and settle differences that may arise. Its directorate should be composed of representative men from the leading cotton centers, such as Boston, Providence, New Bedford, Fall River, Lawrence, Lowell and Manchester.

Take for example the question of tare. The Arkwright Club, composed of mill treasurers, has endeavored to establish a 22-pound tare standard. Some of its members buy on this basis, others on 24-pounds tare, and others without any restriction regarding tare. Some cotton merchants and brokers acknowledge the 22-pounds standard as equitable, and others say they never heard of such a requirement. A ruling regarding tare, decided upon by a directorate such as I have described, would be official and final as a basis for trading in New England. There are many other questions that need to be settled in the same way.

In a recent letter Mr. H. W. Macalister, chairman of the European International Committee on Cotton Exchange Contracts, says:—

"I should like very much if we as a trade (every nation and all of us) would agree to arrange to buy cotton upon one principle, viz: net weight of cotton delivered. If this could be arranged it would be the best incentive possible to improvement in covering and pressing cotton."

The influence of a New England Exchange in bringing about this desirable feature of buying on net weight, would be very marked in co-operation with the European Federation.

The Bremen Exchange has no trading in futures such as exists in New York, New Orleans and Liverpool. In these markets the grade "middling uplands" is bought and sold, but deliveries may be made of many other grades at differences fixed either annually as in New York, or at time of delivery, as in New Orleans and Liverpool. The method which prevails in Bremen is that the exchange establishes fixed standards of grade and staple, and the spinners purchase for present or future delivery the actual cotton that they need and use in their mills. When the cotton arrives it is sampled and arbitrated by exchange officials to determine whether the delivery equals the standard in grade and staple. If inferior to the standard bought, the difference in value is allowed, and also if the deficiency is important, a penalty is imposed on the shipper. On this matter Herr Cramer says:—

"The fine may under certain circumstances even be as high as 3/4 cent per half kilo, or approximate pound. Of course, the trade is not in a position to stand these heavy fines often or even occasionally. Consequently, every merchant will take good care not to have any fine to pay, and the effect of the clause is that the spinner receives as a rule his proper quality."

It is useless to advocate the establishment of a system that would not be mutually advantageous to shippers, merchants, brokers and spinners. Allow me, therefore, to elucidate this point. The Southern dealer or shipper would benefit, because in quoting prices he would know that he and his competitor for the order were both quoting for an exactly understood standard. At present, mills differ in their idea of grade and staple, and many an order is lost by a dealer because he has in mind when quoting a better grade or staple than the mill requires, or than his competitor is proposing to deliver. Then again the exchange arbitration necessitates a fair delivery. First class shippers know that they suffer by the quotations of irresponsible parties, who do not intend to deliver cotton fully up to what they sell. The capable and honest trader is thus protected and rewarded.

The broker or merchant shares with the shipper these advantages and also is saved a vast amount of trouble and risk.

From the spinners' standpoint, there would be great benefit in a thorough system as regards standards and arbitration. There is a wide difference in the methods now prevailing at different

mills in examining cotton received. A treasurer recently told me that he used 30,000 bales annually, and personally passed every bale. In some mills a competent classer is employed. In other mills the superintendent or the overseer of carding is relied upon to pass the cotton, and in many mills I am informed that there is no examination worthy of the name. A few concerns send their cotton to the New York Exchange to be classed. It is generally recognized that New York arbitration is not adapted to so called "staple" cottons. Last year the New York Cotton Exchange classed for spinners only 15,000 bales, which shows that it is not utilized to a large extent for this purpose. The lack of competent classification must undoubtedly be detrimental to the production of many mills. The adjustment of claims with brokers and shippers is by no means an easy task, and generally is in the nature of a compromise. The Bremen system provides for arbitration by two sworn classers, with an appeal to a committee of members of the Exchange. In my judgment there is a great advantage in two men working together and comparing their findings on each bale as they proceed. Every man who has tried to classify cotton will, I think, agree with me in this opinion. So well is the work of the sworn classers done at Bremen that of 2,396,128 bales arbitrated in the year 1907, an appeal was made on only 208,402 bales, or less than nine per cent. The Committee of Appeal sustained the sworn classers' judgment on 96,835 bales, and reduced or increased the allowance on 111,567 bales.

The cost of classifying in Bremen is about five cents per bale, and in New York, ten cents per bale. For stapling 6 1/4 cents per bale is charged in Bremen. Suppose that it cost a mill using 10,000 bales of cotton annually, $1,000 to have its cotton classified, would this amount not be far more than recovered by the saving of the time of its own men, and by the improvement in its product through the uniformity and the maintenance of quality of the cotton used?

Recent years have witnessed remarkable changes in the marketing of the great Southern crop. The increased wealth in the South and the influence of the Cotton Growing Associations have been manifested in the building of hundreds of warehouses and in the endeavor to market the crop slowly throughout the year, instead of in three or four months. It is difficult to obtain statistics of the number of warehouses built, but I am informed that in Texas alone over 300 have been erected, capable of holding 600,000 bales. At Memphis there has been constructed a splendid system of modern fireproof buildings with a capacity of 200,000 bales, with plans for doubling in the near future.

If the warehouse system is still further developed in the future, it seems to me entirely practicable for a New England Exchange to trade in warrants or certificates of actual cotton held in Southern warehouses, either for immediate or future delivery. It is admitted that there would be difficulties to overcome, such as unreliability of classification, but there is no insurmountable obstacle in the way of a final accomplishment of this plan.

A committee of the New York Cotton Exchange has advocated the certification of cotton in Southern warehouses, and also the trading in actual cotton, which would result therefrom. The following extracts from the committee's last report are interesting in this connection:

"By the natural enlargement and development of this certificate system our Exchange will perform for the whole trade its true function, by bringing the buyer and seller together to trade upon a fair basis with the very least amount of risk or delay or uncertainty or loss."

"There is not an objection to this plan that cannot be met and overcome, either absolutely, or by greater advantages in other ways."

"But now extend our system, certificate in warehouses in the South even running lines of grade and also of staple cotton, display these samples in New York and give the spinner just what he is asking for, with the extra advantages of a guarantee of the grade."

"With all these advantages spinners will seek to join our Exchange (just as brokers and dealers do now) and as the export business grows they would meet upon our floor with the cotton sellers and the export buyers. Will not drawing spinners in our Exchange insure us a large amount of new business?"

Why not secure for a New England city the working out of this system? The logical location should be in New England where two-thirds of the spindles of the country are located, and 2,500,000 bales of cotton are annually consumed. It is in New England that most of the finer classes of goods are made, and especially as regards staple cotton, a central market would be of great advantage. The proposed system of certificating cotton would be equivalent in many respects to a spot market in New England, but it might be found profitable and advantageous to go further and carry stocks of spot cotton at this center as well as in Southern warehouses. It should be remembered that frequently the stock of cotton in Liverpool is over 1,000,000 bales and always amounts to several hundred thousand bales. There is no reason why a system that English merchants and spinners find mutually profitable should not also be desirable for our New England manufacturers, for as regards time of transportation of cotton, Boston and Providence are as distant as Liverpool from Southern shipping points. Many mills are borrowing money at high rates of interest to carry for months cotton that they do not need. They could effect a distinct economy by purchasing spot cotton as their requirements developed. This phase of the problem might be further elaborated both as regards the economical financing of certificated cotton, and the saving in freights by sea transportation to one central New England point.

Before closing I wish briefly to refer to the subject of "trading in futures" as carried on by the large exchanges. This question has recently been much discussed; Congress has ordered an investigation of Cotton Exchanges and the report from the Bureau of Corporations is eagerly awaited; bills are before Congress which if they become law would practically annihilate the Exchanges. In connection with this subject, it seems to me that many sophisms have been promulgated. It is said that future trading is a necessity to the industry. Why should it be so, if the wool crop of the

dustry. If we can promote the interests of the great cotton industry and of its affiliated branches, we shall feel amply rewarded for any trouble we may take to elevate the position and further the development of this greatest of our national textile manufactures.

Economic Possibilities of Good Lubrication, with the Results of Twenty Power Tests.

BY WILLIAM F. PARISH, Jr., Vienna, Austria.

The investigations of Dr. Thurston, which were of the highest value in showing the possibilities of efficient lubrication, and the experiments made by Dr. Woodbury, which proved the considerable power differences between various lubricants when used on a testing machine, prompted the author, some twelve years ago, to transfer the investigation of this subject from the laboratory to the manufacturing plant itself, where lubricating conditions could be observed on a broader scale under actual running conditions.

There were many obstacles to be overcome, but from what seem now the rather crude methods at first used an elaborate system has been evolved, which at present in the plant itself gives results of approximately laboratory accuracy.

It will be the object of this paper to discuss the subject of lubricating economies in a general way, to show the means employed to demonstrate these economies, and to give the results actually obtained in various mills in different parts of the world.

If it were possible to entirely remove all friction by means of ideal lubrication the life of all power machines and all machines driven by power would be greatly increased; almost no repairs would be necessary and practically all the power generated could be utilized for useful work. The great difference in the mechanical efficiency of machines caused by the differences in quality, or in suitability, of the lubricants used is not generally known, and engineers usually overlook the economic possibilities contained in this item of the influence of lubrication upon friction, due, no doubt, to the fact that all lubricating oils are considered "necessary evils" without any particular virtue as compared one with another. The greater number of lubricating oil users consider that they have given this problem all the attention it deserves when they buy the lowest priced oils they can get and use them freely. As it is intended in this paper to deal principally with power losses, the waste of such a policy will not be discussed here.

Reduction in frictional losses and consequent saving of power depends upon four conditions:

1. Ability to manufacture various lubricants which will contain a maximum of lubricating nature.
2. The type and condition of the machine or plant to be operated upon.
3. The character and suitability of the lubricant in use and the method of its application.
4. Ability to determine the lubricants which, when placed upon machines of different kinds, will in comparison with those in use produce a lower co-efficient of friction.

While a consideration of the various methods used in manufacturing lubricating oils might be of interest, it is outside the subject of the present paper, but it should be said here that it is possible to make lubricants in such a way that the results of their application are known beforehand, and it is also possible for an engineer trained in this power-saving work to judge within a few per cent. of the exact reduction which it will be possible to secure upon particular machines against any oil in use.

Otherwise it would be impossible to maintain in many countries important engineering departments, fully equipped with expensive instruments for the purpose of showing upon all classes of machinery frictional losses caused by improper lubrication.

WHAT LUBRICATION EFFECTS.

The main effects, which show as a result of reducing the friction of a plant and which must appear in the complete summary of a full comparative power test, are as follows:

1. (a) Reduction in the total horse power of the mill.

(b) Reduction in the power of transmission, and of the power of each subdivisional part of the mill.

2. Reduction in the amount of coal required for developing the power necessary to drive the mill. (Whether it is possible to show this reduction in coal, however, depends upon the ratio of coal to horse power being maintained during both conditions of lubrication. Many experiments have been made which prove that, in the majority of plants, the amount of coal used is not strictly in accord with the work being done.)

3. Reduction in the amount of feed water used for power purposes. (This item is closely related to the amount of horse power being developed, assuming, of course, that steam is not blown off and wasted.)

4. Reduction in the temperature of all bearings and spindle bases.

5. (a) Increase in the speed of machines and spindles.

(b) Increase in the speed of line shaft.

(c) Increase in the speed of the engine if the load upon the engine has been excessive. (These increases of speed are due to the fact that reducing the resistance reduces the per cent. of slippage of the driving belts and bands.)

6. (a) Increase of production of the plant if the production is related to the speed.

(b) Increase in production due to less stoppages,—a considerable per cent. of stoppages are caused through defects of lubrication.

7. (a) Decrease in repairs.

(b) Decrease in the number of bands required for driving spindles.

(c) Decrease in the wear on the belts which would be perceptible, during a long period of time, in decrease of renewals.

All the foregoing conditions will show to some extent if a reduction in friction has been made. They all depend upon each other to a very considerable degree.

COST OF GOOD VERSUS POOR LUBRICATION.

There is one other point to be discussed, and that is, the cost of obtaining a reduction in fric-

tion and the value resulting to the buyer.

From the records of many years' work it is found that the money value of a ten per cent. reduction of the total horse power of a manufacturing plant will more than equal the cost of lubricants for one year. In individual cases it is easy to obtain a record of the total cost of coal for power (coal being the only item effected of which it is convenient and possible to keep a yearly or monthly record), the total horse power, and the cost for oil for one year. It is then possible to determine whether a reduction of a certain amount of power will be of value.

The actual cost for good lubricants need not exceed fifteen per cent. more per year than the cost of the cheapest and poorest. In many cases the cost per year has been reduced by from 5 to 20 per cent., while the price per gallon of the new oil has been sometimes three times greater.

If the engine were overloaded to such an extent that it need be replaced by a larger one, or a motor installed and current purchased, then any reduction that could be made which would keep the old engine in service should be credited with the entire cost of the proposed installation, interest on the investment and any amount saved by not shutting down the plant for the alteration.

DETAILS OF ACTUAL TESTS.

The straight test for one condition usually requires three days. About forty sets of indicator diagrams are taken each day while the engine is carrying full load, a set being all the cards taken from all indicators in operation at one time. A day's record is also made of the horse power required to operate the engine and transmission. This load is usually taken at noon, and not less than ten sets of diagrams are taken for each test. Where a subdivisional test showing the load of each department is being made, the schedule is so arranged that different departments are thrown out of operation for periods not exceeding one-half hour, during which time never less than ten sets of diagrams are taken to secure the average load for the balance of the machinery. On a simple test, with four indicators, a full load and transmission test requires 200 diagrams per day. When eight indicators are used in a subdivisional test, the number of diagrams per day sometimes reaches 2,000, which would make 8,000 indicator diagrams for a four day comparative test. Never has there been a business that has allowed men to become so expert in indicator work as that which requires the conducting of these tests for showing the comparative efficiency of lubricating oils, and the tests given in the present paper, which are only a small selection from those that have been made, could not have been conducted unless there has been an equal opportunity to organize a highly trained staff of engineers native to each country and to equip these men with every instrument necessary for their work.

METHOD OF CONDUCTING A TEST.

It has been found from experience that Monday is a very unsatisfactory day for securing the power of the textile mills and of any other plant that has been shut down over Sunday. This day, therefore, is usually given to setting up instruments and laying out the test. Schedules are prepared and the different men individual to each plant are instructed in regard to their various duties. The test starts Tuesday morning and is usually of eight hours' duration, schedules being arranged to secure an average load which will be quite away from the influences of the breakfast hour in England, the rest hours on the Continent, and noon hours in America, each country having some peculiarity which interferes with a uniform schedule. Mills in Japan run day and night for the entire week which makes it impossible to secure transmission and subdivisional data.

The diagrams are all taken at regular intervals prescribed by the schedule and as fast as they are taken they are stamped and worked out by the Planimeter engineer. The mean effective pressures are then written upon log sheets and at the conclusion of the day's test, the constant of each end of each cylinder having been obtained, the horse power for each card is worked out either with a twenty-inch slide rule or a multiplying machine and the result put on the log sheets. These log sheets are so arranged that by totaling the horse power vertically and horizontally the result will be self-checking. The tests are repeated for two or three days in order that a fair average of all surrounding conditions may be secured. Each separate section of the test has a letter assigned to it, such as A, B, C, etc. Reference to the schedule shows at what time and under what conditions this particular test was made. The comparative test which is made under the same conditions at a later period has the determining letter doubled as AA, BB, CC. Each indicator card is stamped with the date, time, the name of the firm, and this determining letter; all other information in regard to general surrounding conditions, springs, and instrument numbers being kept in a record book, or upon the face of the envelope in which each particular group of cards for any one test is put. For each test the records of all the power influences are made by engineers expert in one particular class of observation. The tabulating and figuring is done mechanically as far as is possible in order to eliminate the personal factor.

The instruments used in making these tests are as follows:

Crosby (Boston) Inside Spring Indicators. For all high and low pressure cylinder work in America, and for low pressure cylinder work in England, Japan and India.

Crosby Outside Spring Indicators. For all high pressure work in England and Japan.

With most of the outfits, Crosby reducing wheels are used, four to an eight indicator outfit. Phantographs are also sometimes used with the American outfits, while the Continental engineers work with, and sometimes prefer, the flat spring reducing wheels.

The Steadying Power and Influence of Consolidation.

BY JAMES LOGAN, Worcester, Mass.

Industrial consolidation is a many-sided problem with many conflicting interests, and hence it must be considered from many points of view, from each of which it presents a different aspect.

No half-hour talk can do justice to even one phase of this, the largest commercial and economic problem with which business men have ever been called upon to wrestle, and one which has taxed and will continue to tax their abilities to the utmost.

A recent economic writer, from the seclusion of his study, far removed from the conflict of the great, busy world, a conflict which often annihilates theories, has written in glowing terms of the beauties of friendly competition; and another forceful writer who, to quote in the slang of today, "was up against the real thing," said, in referring to this article, that the writer evidently had in mind a friendly war or, perchance, a peaceful hell. Present day competition is the same in kind that it always has been though it is different in degree. It is no holiday entertainment,—competition is sharp now but it is going to be infinitely sharper, and we shall not forget that competition is industrial war, and that ignorant, unrestricted competition, carried to its logical conclusion, means death to some of the combatants and injury for all. The law of war is that the strong and well equipped will succeed and the weak or poorly equipped will fail,—but size does not always indicate strength and efficiency.

The theory of some economic writers and teachers appears to be that combinations and consolidations are all wrong and live by wrong doing, but it does not follow that this theory is correct and there is an evident change in the thought of some in this respect. The principle of consolidation is right, but the practice of consolidation can be and sometimes is, wrong. The progress of the world has been the result of combination and consolidation; it is the working out of that principle which separates civilized man from the barbarian. It is the broad highway over which the human race has made progress to its present condition which, notwithstanding the great inequalities which still exist in human conditions is, we believe, the best the world has ever known.

There is only one way in which a consolidation can for any length of time be successful or in a degree eliminate competition, and no new principle is called into being to bring success. It is the same principle whether it be a consolidation of corporation, a single firm, a man or a boy. They must each render exceptional service if they would succeed. The consolidation must share the profit with the consumer by lowering the price. If it does not it will fail, and it deserves to fail if its policy is to create a fictitious value for its product, and to practically say to the public, "Stand and deliver."

The correct theory underlying modern industrial consolidation is greater economy in production,—a larger return of efficiency for effort expended, and not an artificial and uneconomic price for product By a comparison of methods the management determines which is the best and most economical of all the several processes of manufacture, and then having found the best method, the effort is made to bring all the different branches or divisions up to the highest standard of efficiency.

Too many consolidations have been managed not in the interests of the stockholders, the consuming public, or employes (all of which have rights which must be respected), but in the interests of the stock speculators, and the industry is often ruined because more thought is put on the stock ticker than upon the business itself; the policy of the business often being determined, not by what would be the best for the industry, but by what would be best to "bull" or "bear" the stock market.

There are two distinct and separate propositions in the consolidation or so-called trust question. One is the stock or speculative side of the question; the other is the industry itself. Most of that which has been written has dealt with the first question, and next to nothing has been written as regards the effect of consolidated management on industry, and yet this is the all-important part of the question, for, let stock quotations fluctuate as they will, the thing which gives intrinsic value to, or takes value from, the securities of the company is the management of the industry.

We need to remember that the men who are the actual managers in productive industry, who are devoting their best energies to the development of machinery and men; who are giving their best thought to the development of efficiency in the working force and of intelligence in the management of the commercial side of business, are not as a general proposition, interested in speculative doings of the Wall Street manufacturers, whose finished product has been called "securities," if they can be designated by that name without doing violence to the truth.

The consolidation of industrials has made it possible to ascertain how business has been conducted by competing firms, and the methods, or lack of methods, of some have been a revelation.

It has been my pleasure to form the acquaintance of the managers of quite a number of consolidations in different industries, and the experience of one is the experience of all. In some of the companies consolidated they had never known the cost of manufacturing their goods; there had never been an intelligent attempt to learn the cost. The principle upon which they appear to have acted was this: If one manufacturer quoted for an article a dollar, they knew they could make it for less than he, and so quoted ninety cents. There was an absolute lack of system in everything, save in one particular—this system of price cutting without regard to cost was perfect.

Consolidation also developed the fact that some plants were simply museums of antiquity, filled with machinery fit only for the scrap heap. Dead and dying concerns without money enough in the treasury to pay funeral expenses, and that is the only reason why they are still on earth, and the management, or rather, mis-management, might properly have been called "organized incompetence."

An accounting system, to be of any value whatever, should be such that at the close of each period there can be made up a statement of the business in all its detail. It is not enough that the costs should go into a few general accounts; there must be an intelligent subdivision of every item of cost, whether of material or labor, and no accounting system is entitled to confidence which does not classify and properly locate every dollar which has passed through the books. Then if costs are increasing, the comparisons between corresponding

periods will reveal the fact, and if there are leaks they will be detected and stopped.

I have heard manufacturers refer to their bookkeeping and accounting as "unproductive labor," and in a true sense they made no mistake in calling it "unproductive labor," for it produced nothing by which to guide them in the conduct of their business. Accounting unproductive labor? It is the most productive labor in the whole establishment. Its finished product is knowledge born of facts, regarding costs,—not vague, indefinite, thumb-rule guesses.

The management of the large corporation, through the account system, is to do for industry what the inventor has done with machinery, for, after all, a machine is simply organized thought, and while no patents are granted for improvements in management, there are just as real inventions in the field of organization and management as in the field of mechanic arts, and it would almost seem as if a large part of the progress of the future must come along that line, for in certain directions it would seem as if machinery had almost reached the limit, and even though the machine were operated for nothing, the savings would be very slight.

Men have been willing to pay liberally for the highest grade of engineering skill if results could be produced; they have been willing to literally pour out money for new machinery and factory equipment, but it seems never even to have occurred to some of them that in addition to the new equipment of tools and the machinery in the factory, they needed brains in the office, and through this lack they have often been throwing away all the results obtained from a modern, up-to-date equipment and splendid management in the shop, and many a superintendent or manager of the manufacturing or mechanical department of a business has had failed charged to his account when failure should have been charged to the office.

Industrial accounting is being brought to a scientific basis; it is being systematized and standardized, but this work cannot be done by men lacking in the scientific knowledge of accounts and men must be willing to avail themselves of the services of the expert here exactly as they would in the legal, chemical or mechanical departments of their business. It is useless to equip a plant with every modern improvement and then through ignorance in the accounting department, throw away all the results of this modern equipment, and that is just what hundreds, yes, thousands of business men are doing today.

Permit me now to illustrate how the consolidated corporation acts as a steadying power on the market. The price list established by the consolidation is not guessed at by the rule of the thumb. It is wrought out on a scientific basis of accounting and that price list is the basis upon which not only the consolidation but practically every one of its competitors does business. Not that all the competitors of the consolidation always adhere strictly to either the established prices or standards for quality, but the price list established by the consolidation is the base from which they make all their calculations. And this is true even where the consolidations control a relatively small percentage of the product.

I believe I am perfectly safe in saying in not one single industry does the large corporation control the market. It maintains at great cost a system by which its costs of production are very accurately determined and when a new price list is issued every competitor will practically duplicate that list within forty-eight hours or just as soon as they can get it through the printing office. They are not called upon to exercise a particle of judgment and they don't; they simply follow copy and they follow it so accurately that if there should happen to be a blunder in the list they will duplicate the blunder. From the fact that all manufacturers in a given industry issue practically the same list, many persons labor under the mistaken notion that there is an agreement or understanding between them and that the public is being held up, but such is not the case.

Now suppose there were no large corporations to establish a price list or base line. Suppose that not only all of the competitors of the so-called trusts or consolidations, and also each of the constituent companies which form the consolidation, were making their own prices, with absolutely nothing to guide them except the very imperfect data which some of them formerly kept. I have not a particle of hesitation in saying that in my opinion, in the next three years half of them would go out of business, and that is just what would have happened in 1898-99 with thousands of manufacturing companies if consolidation had not saved them.

There were thousands of manufacturing plants taken into consolidations which were thus saved from bankruptcy, and the business then being put upon an intelligent basis, thousands of other plants which were not taken into the consolidations were given a new lease of life,—new conditions being created which made it possible for them to live.

That is the steadying power of the large corporation and the independent manufacturer shares in the gain of this stability which the consolidation creates, and some of the competitors of the large corporation who talk loudest about fighting "the octopus" are in business today simply because the large corporation uses brains in the conduct of its business, and thus the ignorant manufacturer, following the lead of the larger corporations, is saved from himself.

Belts and Belt Transmission.

BY CHARLES F. CHASE, New York City.

As nearly all belts are made of leather we will confine our remarks to that class. You all know that the best leather belting is made from the hides of native steers of the North and West raised in the open and slaughtered at the age of four or five years. While the chemist and experimenter have discovered a number of methods of tanning which require a shorter time to accomplish, it is acknowledged generally that none produce such good belting leather as the old fashioned "lay away" process of oak bark tanning. By this process it takes from nine to ten months from the time the hides are laid away till they are ready for the market. Before being tanned those portions of the hide unsuitable for belting (neck, belly and flank) are cut off, leaving what is called the

"belting butt," the usual dimensions of which are about six and a half feet long by four feet wide.

After the tanning process the "butts" are dried, in which state they are as hard as a board. They are then stuffed with greases and oils (different processes are used by different curriers) to render them flexible and fit for belting. In this process the cheaper grades of leather, much of which is tanned by quick and less costly methods, can be so "loaded" with glucose, sugar of lead, heavy oils and greases as to give them the appearance of good leather. To this "loaded" leather is given what is called a "hard finish" which will deceive any but an expert. Thus the unscrupulous belt manufacturer can sell with good profit at a price absolutely prohibitive to a manufacturer who turns out only high grade belting. Both grades look alike and the inferior grade may weigh more per square foot than the other. The other day a belting manufacturer told us he had recently examined a piece of single belt made by another which weighed 26 ounces to the square foot, while his own belt of corresponding thickness weighed but 18 ounces to the square foot.

Under the new Victoria Pure Food Act every parcel of leather exported from Australia has to contain a certain certificate showing the amount of added weighting matter (sugar, glucose, epsom salts, etc.). The Boot and Shoe Manufacturers Association of this country, at their last annual convention passed a resolution designed to secure legislation to prevent or forbid the use of any foreign substance which is only used to add to the weight of sole leather. Whether it is wise or expedient for this Association to consider taking a similar action in reference to belting leather is a subject for consideration.

We are told that up to the present it has not been found possible to imitate the streak which shows the centre or back bone, so that it is an easy matter to get belts made of centre stock when it is so specified. Four and a half feet is about the standard length for each sectional piece with laps. As a rule belting of the best stock will not wrinkle or "pipe" when bent back and forth repeatedly at a sharp angle. Sometimes wrinkles show at the ends of laps which are termed "fat" wrinkles. They represent the best possible grade for belting. If such laps do not exceed the standard length there is no cause for claiming that you have been cheated. A good belt should lie straight on the floor and be of uniform thickness.

All manufacturers make several grades of belting which they usually advertise under special names. Before being made into belts the "butts" are sorted by men trained for the work just as wool and cotton are sorted before they are converted into yarn and cloth. From all this we can see that (as with oil) the buyer is really dependent on the integrity of the manufacturer. Would it not be the part of wisdom to select a concern in whom you have confidence and trust them to supply you with that which is best suited to your conditions? If they are honest they will treat you fairly as to price.

The Encyclopaedia (New International) tells us that the annual production of belting and hose leather in the United States has grown in value from less than one hundred and sixty-one thousand dollars ($160,500) in 1850, to more than ten and a half million dollars ($10,623,177) worth in 1900. Surely a product of such value commands our attention and is worthy of the careful study of all who have to do with it.

In view of the many changes tending toward economy and better operation which are continually taking place in other mechanical lines, why has the subject of belts and belt transmission been given so little attention?

Is it because the belting bills are now so small there is no desire for further reduction?

It is because it is not known that friction costs money and that to permanently reduce it is like discovering a mine from which will flow a steady stream of the most coveted "coin of realm" so long as the wheels of the mill turn?

There may be and doubtless are many reasons. Those which occur to us are:

1. Because experiments along such lines are left to the mechanical experts or professors of technical institutions who have the time and taste for such investigations.
2. As a rule those trained for superintendents and agents of cotton mills pass through all the departments of the mill except the engine room and the machine shop.
3. The transmission department (engine, belting, etc.) is in charge of one who has all he can do to keep the wheels turning, and who has no time nor inclination for anything that involves extra work.
4. Of the deep rooted trait in human nature to "let well enough alone," and
5. The subject has not been brought to the attention of those vitally interested in the dividends of a plant with sufficient force to induce them to believe it "worth while."

So far as our observation goes, except where the method about which we are to speak presently is followed, belts today are run as they were when their use began.

The money losses due to the ordinary management of belts may be classed under two headings:

1. Tight belts.
2. Belt slippage.

On this subject Jones & Laughlins quote the following from a New England cotton mill engineer of high reputation: — "I believe that three-fourths of the trouble experienced in broken pulleys, hot boxes, etc., can be traced to the fault of tight belts. The enormous and useless pressure thus put upon pulleys must in time break them, if they are made in any reasonable proportions, besides wearing out the whole outfit, and causing heating and consequent destruction of the bearings. If manufacturers realized how much this fault of tight belts cost them, in running their mills, probably they would 'wake up.'"

We are told that a mill with 1,000 looms running on print cloth will turn out about 5,000 pieces per week. If there is an average belt slippage throughout the plant of 29 per cent. (Do you take the speed of your various lines of shafting at full load and again at no load to ascertain what the slippage is?) there will be a loss of 100 pieces per week. Figuring the value of each piece at $2, it will amount to $200 per week or $10,000 per year. It will pay to go to a good deal of trouble to prevent such a loss.

When is a belt tight in the sense of being "too tight" and when is a belt not "tight enough"? The tightness of a belt is not ordinariiy criticised until it causes a hot bearing. On the other hand a belt is considered "tight enough" until slippage becomes apparent to the senses, or until, as we have been told it is customary in some mills, the regular time comes round to shorten (tighten) every belt in the plant.

From our point of view any belt is "too tight" that is wasting power in friction that can be easily saved, while any belt is "tight enough" that runs all right, does not slip, and has sufficient pulley contact to keep well within the strength of the leather to withstand the strain put upon it.

We believe in regularly feeding a belt with that which will make and keep it healthy, just as you believe in regularly oiling a bearing. You, of course, know that every fibre of a belt in motion is constantly changing its position in relation to its neighbors so that a lubricant is needed to reduce internal friction just as oil is needed in a bearing. Withhold the lubricating food and the fibres will get dry — the whole belt will grow hard, crack, slip, and its life will be shortened. We believe further that in general to shorten (tighten) a belt is like beating a horse when it is time to feed him. The effect on both is the same, namely, it takes the life out of each of them.

Eleven years ago the Cling-Surface Co. of Buffalo began to introduce a belt food called Cling-Surface. The test of time has substantiated their claim that its use makes possible the transmission of power with practically no belt tension.

Feed all of your belts with it, applying regularly as it can be absorbed and tight belts are no longer necessary. They will not slip. When a belt is properly filled with Cling-Surface it is permanently benefited and will never get dry and hard again. It can be figured as an asset always because a pound of Cling-Surface put into a belt stays there and is worth more there than when in the can.

It is natural to look askance at that, the claims of which tend to overthrow the rules of existing practice. It has always been so. There may be those in this room today who could have become independently wealthy had they purchased Bell Telephone stock when a generation ago it went begging at a few cents per share.

The intelligent use of this food in all belts (not the few troublesome ones only) to its full extent will accomplish the following: —

1. Your friction load will be reduced at least five per cent. and maybe twenty per cent. How many tons of coal per year will this represent?
2. Your belt expense (including lacings, cement, etc.) will steadily grow less.
3. Your Sunday work tightening belts will be cut out. How many dollars did you spend for this in 1907?
4. Your product in all departments will appreciably increase and its quality improve.
5. You will sell less waste in proportion to your product than ever before.
6. Hot boxes will be unknown in your mill.
7. Your belts, rope drives and spindle bands will be unaffected by atmospheric changes. You will no longer dread fogs or dog days.
8. Your main belt (or any other) in time of flood will not come apart if the water reaches it.
9. Your shafting and hangers will not come down when excess loads come upon the belts suddenly.
10. Your mill will start up Mondays on time.

Figure these ten items of saving in dollars and cents. You will be convinced that the careful feeding of belts will pay and pay well. But it must be done with system along well defined lines. Personal prejudice or lack of interest is fatal to success in any line of investigation.

Each belt is a law unto itself and must be treated accordingly. "Sick" belts must be diagnosed with care. Their present condition and previous treatment considered before the feeding begins.

As no two things in nature even of the same kind are exactly alike so no two belts are exactly alike nor are any two laps in the same belt exactly alike. Therefore it is manifestly impossible to accurately form a judgment until not one but a number of belts (of which some should be new) have been fed for some time according to the best knowledge on the subject.

The bad effects of previous treatments are not always manifest until some time after the proper treatment has been in progress.

As it is the legitimate function of some belts to slip it may not always be wise to subject such belts to a treatment one of whose most valuable features is to stop all slippage.

Some Things a Manufacturer Should Know About Coal.

BY E. G. BAILEY, Boston, Mass.

The majority of manufacturers are dependent upon the combustion of coal for the operation of their mill. The man who is responsible for the continuous and economic operation of the plant should know: (a) Where he can always get coal when he needs it. (b) Where he can get coal of such character and quality that his plant will not be crippled for lack of steam. (c) What coal is the most economical for him to burn. (d) How to convert a large percentage of the heat energy of the coal into useful work.

(a) It is an exceptional circumstance when a manufacturer does not have many kinds of coal offered him at competitive prices. But at times of strikes or delays in transportation he is sometimes compelled to seek coal and pay whatever price is asked. In placing a contract this point should be kept in mind and whenever the difference in price is not too great preference should be given to the company that is most able to keep you supplied with coal at such exceptional times. If you expect fair treatment from the coal company you must treat it fairly by living up to your part of the contract whether the price falls or rises during the continuance of the contract.

When plants are at any great distance from the mines it becomes necessary to store a considerable quantity of coal. This involves additional expense due to the extra handling, value of storage space, and loss of coal both mechanically and chemically. The loss due to oxidation or weathering of coal

not only reduces the calorific value of the coal, but as the temperature of the piles rises, the oxidation becomes more rapid until the ignition temperature is reached and much additional labor and expense is necessary to prevent the burning of the coal and often the destruction of other property. There are many theories as to the cause of spontaneous combustion in coal piles and several remedies have been tried with more or less success. Storing coal under water seems to be the only method of absolute prevention. Sulphur is generally referred to as the cause of spontaneous combustion, but each per cent. of sulphur if burned completely and no heat was radiated from the pile during the slow combustion, would raise the temperature of the pile only 200 degrees Fahrenheit. Many cases of spontaneous combustion occur in piles of coal that contain less than one per cent. of sulphur, and analyses of coal from heated piles show that only a small percentage of the sulphur has been oxidized. Some heat must be radiated from the pile and a temperature considerably above 200 degrees Fahrenheit, is necessarily reached. Should the sulphur exist in the form of pyrites and both the iron and sulphur oxidize, the heat generated would not be great enough to cause the temperature of the pile to rise as high as 550 to 600 degrees, which temperatures have been reached before the coal really ignited. Excessive moisture may play some part in causing spontaneous combustion, but exceptions to this are many. The height to which the coal is piled is generally considered a very important factor, but frequently the hottest part of a pile twenty feet deep is within three feet of the surface. In one case a pile of coal ten feet deep took fire about six feet below the surface and in another part of the same pile the coal was thirty-five feet deep with no signs whatever of heating. Some coals store better than others, the reason for which seems to depend upon its physical structure rather than the chemical composition.

It seems that the rate of circulation of air through a coal pile has more to do with this question than any other condition outside of the character of the coal. The heating is mostly very irregular throughout a pile, as there are usually spots where the temperature is much higher than in the surrounding space. For this reason the usual method of taking temperature measurements in a pile by letting a thermometer down a set of pipes scattered throughout the pile is very unsatisfactory, as the hottest spot that will soon cause trouble may be missed entirely. The question, What is the safety limit for the temperature of a coal pile? is often asked, and it is rather difficult to answer, for a coal pile may heat up to a pretty high degree, then cool down without being moved. But if there is enough heat generated to raise the temperature of the coal pile to 212 degrees Fahrenheit, the moisture being evaporated at or before this temperature is reached leaves only the dry coal which has a comparatively low specific heat, to be heated. The heating takes place much faster and the rate of oxidation also increases with the rise in temperature. The carbon in the coal evidently oxidizes to a considerable extent, as large percentages of carbon dioxide have been found in coal piles at comparatively low temperatures.

(b) Many plants are so limited in boiler capacity, have such poor draft, or some kind of grate or stoker that it is possible for their boiler room force to keep steam with only certain kinds of coal. While this is not an ideal state of affairs, it is a condition that exists in a large percentage of the power plants in this country, and unless a man knows what coal will develop the required boiler horse power in his plant he may have the costly experience of shutting down a part or all of his mill. There is a great deal of difference in the rate of combustion of different coals. The percentage of volatile matter, coking properties, amount and nature of ash are the principal factors upon which depends this characteristic in various coals. It is not always the better or higher priced coals that give the best satisfaction under such conditions, for a cheaper coal might give more satisfactory results than are being obtained with the highest priced coal on the market, but the risk of experimenting has seemed too great for the management to consider stepping out of the well beaten path.

(c) All minerals or raw material are bought because they contain some one ingredient or property that may by a certain treatment or operation be enhanced in value or utilized by the manufacturer in such a way as to cause him to make a profit from the principal product of his factory. It is seldom that any mineral or raw material does not contain some impurity or inert matter that may involve additional expense for its riddance or by a certain process may be converted into a by-product and thus become a secondary source of profit. Coal varies more in character and quality than any other mineral produced. In character it is found in all successive stages between lignite and anthracite. Each different kind is more applicable for one purpose than another. In selecting a coal for making illuminating gas the yield of gas measured in "candle feet" is of primary importance, while the coke and tar are by-products, and sulphur is the impurity that causes additional expense. For making coke the purity, structure and yield of coke are the properties to be considered, and the gas, tar and ammonia may be utilized as by-products. In buying steam coal the amount of heat that may be developed from it is the measure of its value to you. There is no by-product that may be utilized, except that in some cases the sale of ashes might be considered in this connection, but their removal is generally an additional expense. Two coals at the same price and containing the same number of heat units may not be equally desirable. The difference in volatile matter might cause the lower to prove more satisfactory under certain conditions of smoke restriction, while the higher volatile coal would probably be more applicable in a plant with fluctuating load. The amount and nature of ash in regard to the formation of clinker often needs to be considered.

The liability of spontaneous combustion of one coal more than another may make it advisable to pay several cents per ton more for one coal containing no more heat units than the other.

After the most economical coal has been selected, it remains for the manufacturer to see that such coal is delivered. Throughout the year the coal company may send coal of different qual-

ity from other mines, or the quality of the coal from the same mine may change, due to impurities encountered in the seam or lack of preparation at the mine. The coal operator may know of the change in quality, as many of them follow up their product by chemical analysis and inspection much more closely than does the purchaser, but it is the manufacturer's place to know what he is getting and prove to the coal company that the coal has changed and that he is not receiving the coal he is entitled to by the contract. The results of an evaporative test mean but little to anyone except the man who conducts them, and apply only to the one plant and set of conditions under which they were made, while the analysis of coal is now on such a standard basis that the results are comparable whether the sample is taken at the mines, en route, or at the destination. There are many analyses published and given out by a large number of coal companies that represent selected samples of the coal from certain parts of the seam that are absolutely valueless as representing the quality of coal actually loaded at their tipple. Such a policy is short sighted and is fortunately disappearing, for the consumer is going to find out for himself when the coal reaches his plant, and the comparison of results is generally to the discredit of the coal company. But the person who has suffered the most from this practice is the coal man who does give representative figures, for he is judged by the consumer as also giving fancy results and allowance is wrongly made for shrinkage. The present-day tendency is to buy coal on a B. t. u. basis, adjusting the price for the coal delivered in accordance with its quality. The advisability of carrying this into effect depends upon the tonnage, method of delivery, and difficulty in otherwise obtaining a uniform product. The fact that a coal company knows their coal is being systematically analyzed is generally sufficient to ensure the delivery of coal of uniform quality.

In addition to knowing what is the most economical coal to buy, the manufacturer must know —

(d) How to convert a large percentage of the heat energy of the coal into useful work. The efficiency of a boiler plant depends primarily upon the completeness of combustion of the fuel, and completeness of absorption of the generated heat by the water or steam in the economizer, boiler or superheater. It is impossible to generate into available form all of the heat energy of the coal. Some coal and carbon are lost with the ashes, while combustible gases and carbon in the form of smoke usually escape unburned to a greater or lesser extent. The loss due to incomplete combustion depends largely upon the design of the grate, furnace, and combustion chamber, as well as the proportionate rate and method of supplying coal and air to the furnace.

There are so many kinds of mechanical stokers, special furnace designs, fuel saving devices and smoke preventers on the market that the manufacturer is at a loss to know which one would give the best results in his plant or whether it would pay at all to change from the old hand fired stationary grate. Many people install a certain appliance because it has given satisfaction in some plant known to them. They do not stop to consider that their conditions may be different, they may have a more fluctuating load, it may not do equally well with the coal they want to burn, or they may not have men of the necessary intelligence or experience in their boiler room to successfully operate the appliance. A mechanical stoker that does very satisfactory work when one kind of coal is burned may fail when fed with another coal. The fault does not lie in the stoker but in the judgment of the man who tried to burn a certain coal on it under certain conditions. A man, hand firing a stationary grate also frequently fails to keep steam with one coal when he could with another. It may or may not be the fault of the fireman, but such difficulty is usually due to his unfamiliarity with the coal, and he tries to fire it in the same manner he has been accustomed to firing the coal he has previously used. If two firemen, one having always burned a good coal that formed practically no clinker, and the other a coal which clinkered badly, should both receive the same kind of coal of medium quality, one might fail to keep steam and the other would consider that it was of very good quality. In many cases it would pay to make changes in the boiler plant or add more boilers so that the most economical coal could be burned regardless of its quality, as well as to secure as nearly complete combustion as possible.

The question of smoke prevention must receive more consideration from the manufacturer in the future than it has in the past. While it may not be possible or economical to prevent the last traces of smoke, yet there are many stacks in different parts of the country that issue so little smoke that they are not at all objectionable. In most cases where other than anthracite coal is being burned the prevention of smoke has been accomplished by means of furnace design and the method of firing.

After combustion has taken place the heat of the coal appears in the form of sensible heat in the gases leaving the furnace or combustion chamber. The important problem is to cool the gases as much as possible with a minimum of boiler heating surface. In order to accomplish this the heating surface should be kept clean inside and out. Too much emphasis cannot be put on this point. Combustion is more complete with considerable excess air, but this excess air passing through the furnace reduces the temperature of the gases approaching the boiler and the temperature of the escaping gases remains about the same so that a larger percentage of the developed heat is lost up the stack. This condition might be compared with a steam engine running with low initial pressure and exhausting against a high back pressure. The amount of air excess is regulated by the intensity of draft and condition of the bed of fuel. Few firemen have ever had the opportunity of learning what was the best thickness of fire or intensity of draft under the conditions existing in their boiler plant when burning a certain kind of coal. Many people think the stronger the draft the better, but there is opportunity to save thousands of dollars every year in many plants by merely reducing the draft or better regulation of it. The installation of a damper regulator is not always the remedy, for they often cause more loss

than occurred when hand regulated dampers were used.

The analysis of the flue gases is the best criterion for regulating the conditions of a furnace so as to obtain nearly complete combustion with a minimum of air excess. The perfecting of automatic gas indicators and recorders will do very much toward increasing the boiler room efficiency.

No one kind of boilers or heat absorbing apparatus will give equal satisfaction in all plants. This depends upon location of plant, kind of water, uniformity of load, kind of coal, etc., and must be determined in each individual case.

It may seem unnecessary to investigate so thoroughly what would be the most economical fuel, how it can best be burned, and how the largest percentage of the heat can be converted into useful work, but the money saved by doing so, even in the smaller plants, amounts to a surprising sum in the course of a year. The manufacturer who is too busy enlarging his mill and increasing his output to give corresponding attention to his boiler room usually regrets the mistake when all his labor is standing idle for lack of power or the coal bill becomes a disproportional percentage of his cost of operation.

The Construction and Ventilation of a Weave Shed.

BY SAMUEL M. GREEN, Holyoke, Mass.

In the fall of 1904, the Farr Alpaca Company, of Holyoke, Mass., commissioned the writer to build a weave shed for them, and specifically stated that they wished the difficulties experienced with the weave shed they were then operating eliminated as far as possible in the new design.

Mr. W. W. Stearns, the superintendent of the manufacturing departments of this company, had for many years contended with the difficulties experienced in the old type of weave shed and had copious notes and suggestions in regard to betterments.

The first weave shed, with sawtooth skylight, for this company, was erected in 1874. This shed had a rather low roof and constant difficulty was experienced with leakage and condensation. It has also proved very difficult to properly ventilate.

It was determined to find out if possible the latest practice in weave shed construction, and Mr. Stearns visited a large number of the recently constructed weave sheds in the southeastern part of Massachusetts and Rhode Island. He was surprised to find that apparently little progress had been made in the elimination of the difficulties which he had experienced with the old type. He found that a great many sheds were being heated and ventilated by a fan system, but these systems had been so installed that in winter portions of the room were too cold or too hot.

The condensation from the glass and roof was a great annoyance in about every shed visited. We therefore determined to see what could be done to remedy these difficulties and this paper is descriptive of the weave shed that was constructed, and as the desired results have been accomplished, it may be of interest to the members of this Association.

I will not go into a discussion of the reasons for the use of what is known as the sawtooth construction of skylights for weave sheds because everyone familiar with this class of building knows it to be the only practical way of properly lighting such a building. The advantages of the sawtooth form of skylight over the ordinary hipped skylight are north light and elimination of the direct rays of the sun.

1. Practically all of the troubles of the sawtooth method of skylight construction are caused by severe winter weather conditions and can be classed under two heads, i. e., leakage caused by severe snow, ice or sleet storms, and inside condensation caused by low outside temperature.

When snow and ice accumulate on a sawtooth roof, they melt near the peak of the roof and run down towards the gutter. As the water runs into the shadow caused by the peak of the next sawtooth, it will freeze on the lower portion of the roof and in the gutters. This alternate freezing and thawing causes the water to back up under flashings, and it is therefore necessary to make them absolutely tight.

3. The gutter proper is made as follows:

The corners formed between the bottom of the gutter and the curb on one side, and the gutter and the flat roof on the other, are filled with a fillet of wood of curved shape. Then sheet asbestos 1/16 inch thick is laid, extending up to within 3 inches of the glass on one side, and 2 feet on the flat roof on the other side. On this asbestos is then laid galvanized iron of about No. 24 gauge, extending to the same height as the asbestos paper. This galvanized iron is nailed to the roof. The object of the galvanized iron is to make a gutter firm and smooth to walk upon, and cover any imperfections in the plank. This is especially necessary when the planks shrink, as otherwise anyone walking in the gutter would, in time, puncture the roof, either through the cracks between the planks caused by shrinkage, or through imperfections in the plank. The asbestos paper is first laid underneath this galvanized iron, in order to prevent the moist air from the room below finding its way through the cracks in the plank, striking the galvanized iron and condensing and dripping back into the room below. After the gutter is thus prepared, it is ready to receive the regular five-ply or pitch roofing. In the gutter itself six-ply is used, to strengthen the roof at this point. The roofing material itself should be thoroughly nailed and mopped. Immediately underneath the lower end of the glass there is a flashing of galvanized iron, which is cut into the sill of the skylight by a specially prepared tool. The wood is simply opened by a thin wedge and the galvanized iron driven into this opening. This galvanized iron extends down and over the roofing material and is thoroughly nailed throughout its entire length. It is then mopped with pitch to make it watertight.

4. To determine the best method to use for the stiles of the skylight, I placed in the old weave shed a system of metal bars of well known make. This was during the winter. It was found that the drainage from this metal bar to the outside froze and the water of condensation was delivered into the room instead of outside the building. In severe weather moisture would collect on this bar

and icicles would form on the lower part of it. I therefore discarded the metal frame.

5. The stiles or bars of the skylight were made of white pine, firmly fastened to the curb and ridge with brass screws. Both the curbing and stiles were kiln dried and were shellaced before delivery on the roof.

6. The glazing is double; the inside light is of 1/4 inch factory ribbed glass, and the outside of plain double-thick glass. The outside glass is held from slipping downwards by means of brass screws. Both lights were thoroughly bedded in putty and the outside light was properly drawn. The putty used contained 33 1/3 per cent. of white lead.

7. The gutters are drained at various points throughout their length. A copper bowl is set into the roof and this bowl is set down into the plank so that there will be no accumulation of water immediately around it. From this copper bowl a copper pipe is connected to a down-take column, which in this instance, is made of channel iron. The down-take pipe passes within this column to the drainage pipes in the basement. The roof bowl and down-take are covered by non-conducting material. A shield of galvanized iron is placed over the down-take pipe where it passes through the channel iron column. This shield is fastened to the down-take column to protect the copper down-take from injury.

8. The roofing material used upon this weave shed was five-ply asphalt, and especial care was taken in nailing the felt to the roof. The roof has now passed through three (3) winters and does not show as yet any signs of deterioration. If it lasts through another winter I shall consider it good for the purpose.

9. The supporting work of the roof is of steel. The columns are I-beams, these being used because they were narrow and allowed the looms to be set close together. The columns are continuous from the toe of the skylight to the foundation in the basement, and are bolted to these foundations. The main floor is supported upon I-beam stringers, upon which, at right angles, are bolted wooden timbers. To the top of these wooden timbers a four inch matched plank is spiked, and on the top of this is a 7/8 inch hard wood floor.

10. It will be noted that the looms are driven from overhead counters and shafting. A great many weave sheds are driven from shafting in the basement, but experience seems to have proven that with the belts below there is a great deal of loss of time of loom fixers going into the basement, in order to throw the belts on. The convenience of handling the belts with the overhead drive, in the opinion of Mr. Stearns, more than offsets the inconvenience and dirt occasioned by having the drive overhead.

The method of drive is by electric motors, belted to the main line shafts, these line shafts being belted to various counters and from the counters direct to the looms.

VENTILATING AND HEATING.

After a thorough investigation of the methods in vogue in various weave sheds throughout the country, it was decided to heat this shed by direct radiation, and to accomplish this result, steam pipes were placed around the walls of the building, near the floor, and also run lengthwise of the building, underneath the skylights. One-third of the amount of pipe in this building is at the roof, and two-thirds near the floor line.

The direct system of radiation was adopted because of the fact that it is more economical to operate.

For the ventilating, cooling and humidifying, fans were placed in the basement. There are two (2) steel plate blowers, having wheels ninety inches in diameter and forty-eight inch face. They can either draw air from outside from the basement, or from both sources. These fans are each driven by a 25 horse power motor, and they run at 150 revolutions per minute. The builders' rating for each of these fans, at this speed, is about 48,000 cubic feet of air per minute. Each of the fans, when running at its rated speed, requires 20 horse power to operate it.

The air is drawn from outside or from the basement, or from both sources at the same time.

For cooling and humidifying the air in the summer there is a system of spray nozzles placed in the conduit through which the air from outside passes to the fans.

These spray nozzles are of special design and deliver the water in an exceedingly fine spray into the air current. There are forty-eight of these nozzles and they require thirty gallons of water per minute, under about forty pounds pressure. The water to supply them is pumped from the ground by a triplex power pump, requiring about 3 1/2 horse power to operate it. The temperature of the water from these wells always remains at 54 degrees Fahrenheit. After the air passes through this fine spray of water it encounters baffile plates which remove the entrained water, and the air then passes on to the fans, and is carried by galvanized iron piping to various sections of the basement, and from there passes up into the weave room above through pipes in the walls, and is delivered into the weave room at about eight (8) feet above the floor. Deflectors have been arranged on these outlets so that the air can be guided in the proper direction, as it was found that if this current of air strikes the weavers they feel chilly. It is therefore guided just over their heads.

On each sawtooth there are provided four (4) sixteen inch ventilators. Roof ventilators have been a constant source of annoyance owing to the fact that they condense the moisture from the outgoing air, which drips into the room below. The walls of both the stationary and revolving parts are made double and the space between is filled with non-conducting material. A damper shuts against soft packing and has proved satisfactory. A slight amount of condensation, however, has occurred even with this tight-closing damper, and this is cared for by a metal trough, into which this condensation drips. It alternately collects in this trough and then re-evaporates.

Both fans are operated at their maximum capacity during the summer. For humidifying and ventilating in winter, one fan is operated, drawing part of its air from the basement and part from out of doors. The air is humidified by passing over an iron trough in which water is boiled. The steam arising from this boiling water accomplishes the proper humidification.

There are a large number of openings from the weave room into the basement, at the floor line. These openings are protected by automatic dampers, so that in case of fire they will automatically close. These openings are utilized in winter for circulating the air from the weave room into the basement.

It has been found that this method of ventilating, cooling, and humidifying, has been exceedingly satisfactory. There are no parts of the room that are not thoroughly ventilated, and there are no "dead" spaces where condensation can occur. The air is kept perfectly sweet, and clean and the conditions, as far as humidity is concerned, are good. The cooling has been very successful. The temperatures in this weave shed have been kept much lower than the temperatures in the old "A" weave shed, and on hot days have kept as low as, or lower than, the temperature of the outside air.

It is believed that this cooling tends to better work and to attract a higher class of operatives. The whole system has been so satisfactory that the Farr Alpaca Company have decided to completely rebuild their old "A" weave shed along these lines.

The Combing of Short Staple Cotton.

BY JOHN W. NASMITH, Manchester, Eng.

The title of this paper suggests at once the necessity for a definition of what is meant by short cotton. When the Heilmann machine first came into use, it was said to be a comber for short fibres, since no attempt had previously been made to comb cotton at all, but only the long wool fibre, and when it came to be used on Egyptian cottons of 1 3/8 inch staple, it was thought to be combing the shortest cotton that it would pay to comb, and indeed this would be so, had the Heilmann machine remained the only one. It was the necessity in the hosiery trade of having very regular and very clean yarn of coarse counts that first suggested the combing of "short cotton," and we may now define what is meant thereby. It is intended to include in the term "short cotton," those classes with staple from 5/8 to 1 1/8 inches in length.

It may first be shown why the Heilmann is debarred from dealing with such short fibres. Two points stand out clearly. First, the separation of the tuft from the lap is brought about by the contact of the leather detaching roll, not with the fluted segment on the cylinder but with the steel roll in front, so that between this point of contact and the top comb, there is the full diameter of the leather roll. The diameter of the leather covered detaching roll has been reduced to meet this difficulty to the utmost limit consistent with the necessary rigidity. But this diameter is still much too great to deal with short cotton as defined above, and so the waste is excessive, indeed prohibitive. Secondly, there is the vital question of a piecing, and in the Heilmann comber, it is impossible to get a satisfactory piecing with stock shorter than 1 1/8 inches, and it fails entirely below one inch.

The first effect of a bad piecing on short cotton is the frequent breakage of the slivers on the comber table, causing frequent stoppages, reduction of the already small production of the Heilmann and an excessive amount of waste sliver. The bad piecing cannot be obliterated at the comber draw box, and the result is a weak sliver all through the draw frames with frequent stoppages and large quantities of waste to be returned to the scutching room, after labor has been expended upon it. The weak slivers and consequent frequent piecings at the comber and draw frames, make themselves felt in the form of irregularities in the yarns. From this it will be seen that one of the chief difficulties in connection with the combing of short cotton lies outside the comber itself, and is caused by the weakness of the slivers due to bad piecing.

To obviate these difficulties, the Pinel Lecoeur comber was invented and made by Hetherington, and it reduced the waste made in combing short cotton and made a fair piecing even with 5/8 inch Surat cotton. The writer erected nearly all the machines of this type that were made for European mills, and most beautiful hosiery yarns of coarse counts were made from 5/8 inch Surat cotton, with about 23 per cent. of waste, which was collected right at the comber into a sliver and passed through draw frame slubber and intermediate, and spun at once into 4's yarn, while cloths of excellent qualities were produced from one inch American cotton.

But this machine failed to make the combing of short cotton a commercial success, for the following reasons: —

(1) Its production was not greater than that of a Heilmann, and although it made a better piecing in appearance, the sliver was not amalgamated at the piecing and drawn together, but simply overlaid.

(2) The waste was still too high, rendering the process expensive.

(3) The machine was complicated and difficult to set.

The Nasmith comber is now happily well known, nearly 2,000 being at work, and one of the attributes of this machine is its capability of dealing much more satisfactorily than its predecessors with staples between 5/8 inch and 1 1/8 inches, for not only does it produce double the weight per machine, but it renders it possible to comb these short staples without excessive waste, the two essentials to make such combing commercially practicable. In addition to this, it makes a piecing, which, even on these short cottons, is practically perfect.

In all combers except the Nasmith, the piecing consists simply of laying the tips of one lot of fibres over the tails of the previously detached series, the overlap being about 1/2 inch on long cottons, and with short cottons, no sliver can be made that will hold together along the table. But the nature of the piecing in the Nasmith machine is quite different, there being not only a long overlap much exceeding the length of the staple on the short cottons, but the ends are thoroughly amalgamated by being drawn in while the overlap is being made. This does away with the serious difficulty of manipulating the combed slivers at the subsequent operations, and make such operations quite normal in character, causing neither excessive waste, nor stoppage. A sliver of 3/4 inch cotton taken just before entering the draw box

on a Nasmith, can be raised from the table and will sustain its own weight for the full length of the table, which provides ocular demonstration of the soundness of the piecing.

In the hosiery trade, the machine has long ago established itself as the best for the purpose, and there is at the present, a growing demand for combed American yarns of medium counts.

A little consideration will show the difficulties in the way of combing short cotton, without taking out too much waste. In Sea Island cotton for instance, neglecting a small percentage of mere fluff, we have all lengths of fibres between 1/2 inch and two inches, and it is comparatively easy to select, in combing, all those below one inch and comb them out. But in one inch stock, the difference in length between the long and the short fibres is much less, and it becomes increasingly difficult to select only the short, as the difference decreases.

The technical point which renders it possible to comb short cotton on a Nasmith comber without excessive waste, is that the nipper can be brought very close to the nip of the detaching rolls with just space between for the top comb, so that there is only half the diameter of the detaching roll between the top comb and the nipping point of the rolls, instead of the full diameter of leather covered detaching roll, as explained above.

As regards the actual work of the machine, it may be said that 850 pounds of combed sliver of good quality can be produced weekly per machine, on one inch stock, and with waste from 15 per cent. to 20 per cent., according to quality required.

Another point of utility of the Nasmith comber has been recently developed in European mills, namely, the recovery of the good cotton in the strips from the flats of carding engines, and in this connection, the following data may be of interest, and it must be noticed that the yarn made from the combed flat strips is always much stronger than the carded yarn made from the original cotton.

RECLAMATION PLANT.

TEST OF 100 POUNDS OF CARD FLAT STRIPS.

American (Orleans) Cotton passed through Combined Creighton Opener and Scutcher, Revolving Flat Carding Engine, one head of drawing and made into laps on the Sliver Lap machine preparatory to combing on the Nasmith Comber.

Loss at Combined Opener and Scutcher,	7 lbs. 6 oz.
Loss at Card,	16 lbs. 2 oz.
Loss at Comber,	19 lbs. 2 oz.
Total loss,	42 lbs. 6 oz.
Total weight of finished Sliver ready to be put up at the third head of drawing,	57 lbs. 6 oz.

COMPARISON OF COST AND PROFIT.

Value of 1,000 pounds of strips at 2 3/4d per pound,	£11	9 2
Wages:		
Blowing room,		2 0
Carding "		2 0
Combing "		10 0
Expenses:		
Incidental,		1 0
12 1/2 Depreciation and interest on capital outlay including 1 Comber and 1 Lap Machine,		13 5
	£12	17 7
Value of 570.375 pounds of Combed Sliver at 7 7/8d per pound,	£18	14 4
Value of 190.125 pounds of Comber Waste at 3/4d pound,		11 10
	£19	6 2
Less value of 1,000 pounds Strips and working exes.		
	£12	17 7
Total Net Profit from 1,000 pound strips which 1 Nasmith comber will treat in one week of 50 hours under normal conditions,	£6	8 7

Test of Cops spun from Combed Flat Strip, as against the ordinary yarn: — Waste made on comber, 24 per cent.

Ordinary yarn.

Weft cops,
Average of eight wrappings,
Counts 74 1/4 pulls 16 1/4 pounds.

Yarn from Combed Strip.

Weft Cops,
Average of eight wrappings,
Counts 73 1/4 pulls, 19 pounds.

Twist Cops (ordinary).

Average of eight wrappings,
Counts 63 5/8 pulls, 22 1/8 pounds.

Twist Cops from Combed Strips.

Average of eight wrappings,
Counts 65 pulls, 24 1/2 pounds.

Test of Cops spun from one end of combed strip sliver mixed with seven ordinary ends at the draw frame.

Ordinary Yarn Twist Cops.

Average of six wrappings,
Counts 40.1 pulls, 41.8 pounds.

Yarn from one end of strip.

Seven of ordinary sliver,
Average of six wrappings,
Counts 41.5 pulls, 43 pounds.

Testing of Yarns.

BY WILLIAM MYERS, Lecturer on Textiles, Municipal School of Technology, Manchester, Eng.

In dealing with a subject of this kind it is well at the outset to consider the nature of the tests to which yarn should be subjected, and the best and most efficient methods of applying those tests.

Nature of Tests. Yarn must be tested for count or number, strength, elongation to breaking point, elasticity if possible, twist, regularity, cleanliness, moisture, and diameter. It is proposed to deal with several of these in this paper, and the remainder will be dealt with in a subsequent paper.

The reason for adopting this course in that the whole subject cannot be adequately dealt with in one paper.

Condition of Material to be Tested. A good deal depends upon the condition of the yarn as to the kind of apparatus which may be used. Yarn may be tested from the cop, the ring bobbin, the hank, the ball warp, the beam warp, and from the woven texture.

Testing for Count. Assuming that the bulk of the yarn which has to be tested for count will be in the condition in which it has left the spinning machine, it may be well to discuss and determine: first, the most suitable length of material to test to arrive at an accurate result; second, what are the differences to be found in the count of a yarn when various lengths are tested; third, the effects of testing the material from various parts of a cop or bobbin and to note what differences, if any, exist; fourth, the most suitable method of measuring the yarn, the tension to be put on during reeling and the effect on the length of yarn reeled due to tension and possibly the speed of reeling.

The most common way of testing yarn for count is to wrap a lea from each of several cops or bobbins taken at random from a delivery of yarn. Now while there may be no particular objection to this plan, it will be found advantageous to vary this procedure and take a number of tests from the middle and near the finish of a cop or bobbin.

Now having these variations and averages in mind, does it not seem reasonable to suggest that occasionally at least the whole instead of a part of several cops might be tested for count; and while there is variation, if it is found that the net result is a good average count, then the manufacturer has had delivered to him all he is entitled to, so far as count is concerned, because in a fabric or warp the average count must be taken into account, as it is this which determines the weight of the texture. This of course assumes that the variations from the reputed count are not excessive. As regards average strength, that is a matter for further consideration.

The yarns have all been reeled at the same tension, and as far as possible at the same speed. The wrappings have all been weighed on a chemical balance, and readings to 1/100 of a grain recorded. In all cases the wrappings have been taken consecutively, and thus the variations may be readily traced.

Measuring the Yarn. Regarding the most suitable method of measuring yarn it may be said that an expert reeler can adjust the tension by hand, and with constant practice he can reel the yarn at a regular speed, but it is desirable that there should be some more reliable method of obtaining regular results as to length and tension. To remove some of the possibilities of variation, a few spinners and manufacturers have their warp reels driven mechanically at a fixed rate, and the tension may be regulated by passing the yarn amongst a series of glass tension rods.

Weighing the Material. After the yarn has been measured it must be weighed and the count calculated. For accurate weighing nothing is better than a chemical balance and weights graded to 1/100 grain. This plan, however, does not lend itself to the every day practice of a mill warehouse or office, hence a number of special balances have been designed to expedite this work.

Variations from Reputed Count. There does not appear to be any recognized basis of allowance for variation above or below the reputed count of yarn as between the spinner and the manufacturer, the spinner being naturally anxious not to deliver yarn which is appreciably finer and the manufacturer being unwilling to pass yarn which is appreciably coarser than the reputed count. Now to the manufacturer this question of the variation in count is a very important one indeed, particularly if the variation is consistently on the coarse side. and it must be clearly understood that the variation spoken of now is not the variation in one cop, but the average variation from the reputed count.

Dr. Herzfeld in his work on the Technical Testing of Yarns and Fabrics, gives the following table of variations above and below reputed count, but it does not appear that either these allowances or any other are in general use, although some manufacturers insist on having their yarn delivered on the fine side of the reputed count.

TABLE OF ALLOWANCES.

Waste Yarn, 1 to 6, including imitation,		4.0%
	1 " 10,	2.5%
Cotton,	11 " 20,	2.0%
	21 " 40,	2.5%
Above	40,	3.0%

and other percentages are given for other fibres.

Cotton Cultivation in West Africa.

BY WILLIAM HOWARTH, Bolton, Eng.

But it is to West Africa that the energies and moneys of the British Cotton Growing Association have, in the main, been directed. During the American Civil War some £76,000 worth of cotton was shipped from the colony of Lagos to Liverpool. After the conclusion of the war the shipments ceased. It is not unfair to assume that the cotton which came in the panic days was due to merchants sweeping the coast towns of all the native cotton they could buy. When the panic subsided and prices became normal, the merchants, dealing in less bulky and more profitable commodities, ceased to interest themselves in cotton and the possibilities of West Africa as a cotton producing country were forgotten. But, with the birth of the British Cotton Growing Association a new era began. Sir Alfred Jones, the president of the British Cotton Growing Association, and others associated with him in trade brought the claims of West Africa before the Association. It was stated that cotton grew wild in almost every colony. and, that although no cotton was exported, the natives away from the coast towns were clothed in clothes spun and woven from native cottons.

Several American cotton experts were engaged and were instructed to make a survey of the Gambia, the Gold Coast, Sierra Leone, southern Nigeria and northern Nigeria. The reports of these experts confirmed all that the West Coast merchants had stated. Cotton was indigenous in every colony. The soil and climate was in each case suitable and with the exception of the Gold Coast,

where the gold mines drained the labor, ample, cheap and in some respects efficient labor was available. In every case the natural conditions were such as to justify the Association in looking upon these colonies as promising cotton fields. Subsequently it was decided that competitive products in Sierra Leone and the small area of the Gambia were limiting influences which would, in the two sections named, tell against cotton being produced to any large degree.

It was to Lagos and Nigeria that the efforts of the Association were directed. Much experimental work required to be done. The native types of cotton were found to be of a Peruvian class with a brownish cast. In a few places cotton of a whiter and smoother quality was found, but generally speaking, the native cotton was not of a character which commended itself to the Lancashire trade.

The council of the British Cotton Growing Association decided that it was of the utmost importance that all undesirable types should be eliminated from West Africa and that a class should be grown suited to our needs. To this end the energies of the Association have been consistently directed. Probably for centuries succeeding generations of Africans have been planting in a haphazard and promiscuous fashion the cotton seed which came into their hands. Cotton was cotton, and whether good or bad from a white man's standpoint, it was all equally valued by the native.

To instruct the native in relative values and simultaneously give him confidence in the Association, to establish seed farms for the selection of cotton types and the development of hybrids, and to erect ginneries so as to secure full control of the seed were duties which the Association undertook to carry through. Surely no light task. English, scientifically trained agriculturalists were sent out to Lagos and Nigeria, and they have laid the foundations upon which a great industry will undoubtedly be built.

Briefly put, the Association came to the concluclusion that, whether planted in West Africa or in any other part of the world, cotton of any variety other than Sea Island, must necessarily be a black man's crop. The return per acre is not sufficient to adequately remunerate white men. The idea of purchasing estates, although land at a nominal price could be secured, and endeavoring to run them at a profit was definitely set aside. I believe it is a truism of the black man as of other sections of humanity, that he works best when he is his own employer. When this decision was come to, it was fully realized that the Association was putting aside the possibility of making a quick movement but on the other hand, it was also seen that if the natives could be got to take an active interest in the work, the field of effort would be of a gradually widening character and whatever success was achieved would rest on a permanent basis. To secure the confidence of the natives, agents of the Association visited the most important centres of population and promised that a market should be found for all cotton tendered and that the price would be two cents per pound for seed cotton. The officers of the government in many cases accompanied the agents of the Association and verified the accuracy of the declaration.

A small ginnery was also established at a place called Aro, to deal with any cotton the natives of that district might have by them and also to demonstrate the fact that the Association was not a mere paper one. As previously stated, the cotton which the natives tendered in these early days, was not exactly the type required. While it was strong and usable, a reddish cast with which it was tinged reduced its value. The first seed farm was therefore established in connection with the ginnery at Aro and for the past four years selected native cottons and hybrids of many descriptions have been experimented with. The lines followed have been almost identical with the system developed with so much success by the State of Mississippi.

The council of the Association again in this matter agreed that rapidity of movement should be sacrificed in order that efforts to improve quality should not be wasted. It was agreed that the colonies should be emptied of all cotton seed of poor types. In order to accomplish this a monopoly of cotton ginning was necessary. This has been arranged and ginneries have been established at several points. Photographs of these establishments which are herewith presented, will illustrate, perhaps more effectually than what I can say, the progress the Association has made.

The Marlborough ginnery at Ibaden which was opened last year and is capable of dealing with 12,000 bales per year, embraces in its equipment all the best features of American plants and also a gin compress superior to any other existing arrangement. The Alfred Jones ginnery at Oshogbo opened in February this year, is built on lines similar to the Marlborough but is double its size.

Cotton of whatever type tendered at the ginneries, has been accepted and paid for and selected seed given to the natives to enable them to plant for the succeeding season. The results speak for themselves:

COTTON EXPORTS FROM WEST AFRICA.

1905	2,760
1906	5,687
1907	9,661

in bales of 400 pounds each.

It may be here stated that by using an automatic feeding and weighing arrangement all the bales are made to an exact 400 pounds standard and are pressed to a density of 32 pounds per cubic foot.

It may not appear to American go-ahead spinners that much has been accomplished. We on this side, however, are quite satisfied. The progress made has been quite as rapid as the most sanguine supporters of the British Cotton Growing Association anticipated.

The fact that 10,000 bales of cotton have been grown in one season is reasonable proof that the soil and climate is suitable, and we are now entitled to measure up, in any ordinary way, the future prospects.

First, then, with regard to quantity. The experiments carried through have shown that certain native types can be so trained as to produce a most desirable class of cotton. The progress made in this direction is well shown by the comparative prices realized for African cotton in 1905 as compared with 1907. In 1905 the bulk of the

cotton brought to Liverpool was sold on the basis of Middling American.

During 1907 the greater portion of the crop has realized from 30 points on to 300 points on Middling American, thus showing that from a quality standpoint a marked improvement has been effected.

Quantity. So far the work of the Association has been confined mainly to a narrow strip of land running alongside the railway from Lagos to Ibaden a distance of 120 miles. Lack of transport facilities prevented a wider movement. Head carriage with 60 pound bundles has been the only method generally available for getting produce from interior points. In addition to this the palm oil and ground nut industries are competitive in the area the Association has so far operated in. The Association has steadfastly refused to open up stations in outlying districts. Under these conditions the 10,000 bales secured last year must be looked upon as a marvellous result.

Beyond Ibaden, there is a tract of country equal in area to more than one-third of the possible growing field of the United States. There is no competitive industry. The natives numbering fifteen millions, after centuries of inter-tribal warfare are settling down to the one industry they understand, that of agriculture. Of cotton itself they have some knowledge. I have heard a Government officer who has been up to Kano, the commercial centre of this country and which is, by the way, a black man's town of over 100,000 inhabitants, declare that thousands of bales of native grown cotton are marketed, spun and woven each year.

The British government has now decided that this country shall be provided with proper transport facilities.

Cotton Mill Stocks as Investments.

BY W. IRVING BULLARD, Danielson, Conn.

Cotton mill stocks are attractive investments because of stability of market value, large dividend returns, liberal margin of earnings over dividends and high ratio of liquid assets to capital stock. The seasoned textile stocks compare favorably, from every market viewpoint, with the better class of railroad and industrial stocks, and in many cases, the book value and quick assets back of the "textile" place it in the same class with the stronger industrial and railroad bonds, without a limit on the investment return as in the latter securities. Cotton mill stocks are a first and only lien on an industry of great economic power producing one of the fundamental necessities of life, capable of limitless expansion and very much under capitalized. This is the only industry that has not been subjected to consolidations, trusts and combines, or had its stocks watered to the last degree.

In many states, cotton mill stocks are exempt from taxation, and return to the investor a very much greater income than could be secured from any other form of investment, with the same security of principal. These securities are inherently safe and while the dividend return may fluctuate from year to year, because of the extra dividends paid during periods of prosperity, the average annual dividend return will be vastly more than could be secured from any other form of conservative investment. Cotton mill stocks are conservative investments because of the ample margin of earnings over the dividend requirements, the low capitalization as compared with replacement value, the conservative allowances for depreciation, the very large actual net assets which represent the security of the principal, and the highly efficient management characteristic of the cotton industry.

DIVIDENDS PAID ON COTTON MILL STOCKS.

The liberal dividend policy of leading cotton mill corporations in New England should be the first consideration of the prospective investor. During the past eight years, which period constitutes an economic cycle of our industrial welfare, such seasoned textile stocks as Bates paid an average annual dividend of 16 1/4 per cent., Dartmouth 19 3/4 per cent., Laurel Lake 23 3/4 per cent., Pepperell 19 3/4 per cent., Troy 23 5/8 per cent., and Union 22 9/10 per cent, and during this period have added a greater percentage to their surplus and working capital. A comparison of surplus earnings over the dividend requirements of ten cotton mill stocks with an equal number of high grade railroad bonds and industrial preferred stocks place the "textile" in an enviable position.

There is no class of investments paying as attractive dividends, earning so large a surplus and showing so great a book value per share as cotton mill stocks. The ten Fall River stocks which I have used in one of the tables, show larger dividends, greater earnings per share and less market value depreciation than ten of the better industrial preferred stocks that are held quite extensively in New England.

Last year, Boston & Maine showed a margin of safety of earnings over dividend requirements of 1.25 per cent., St. Paul 5.74 per cent., Chicago & Northwestern 6.26 per cent., Delaware & Hudson 6.93 per cent., Great Northern 6.1 per cent., Illinois Central 4.6 per cent., New York Central 1.42 per cent., and Pennsylvania 2.51 per cent., while an equal number of New England cotton mills, not including Fall River and New Bedford, showing a margin of safety of an average of 9 1/2 per cent. Fall River earnings were much greater.

THE NEW BEDFORD GROUP.

The aggregate amount paid by New Bedford cotton manufacturing corporations in dividends in 1907 was $2,489,750, or $1,110,250 more than was paid in 1906, an increase of 80 1/2 per cent. The average dividend rate paid in 1907 on the capital stock of New Bedford's cotton mills, other than those which are new, was 15.18 per cent. For the past ten years, dividends have averaged as follows: Acushnet 21 per cent., Bristol 3.17 per cent., City 10 per cent., Hathaway 13 per cent., Pierce 11 9/10 per cent., Potomska 5 3/10 per cent., Wamsutta 6.35 per cent., Grinnell 9.8 per cent. for seven years on a present capital of $1,000,000, Whitman 7.4 per cent. for five years on its present capital of $1,500,000, Dartmouth 18 per cent. since 1899, when it began paying dividends. New Bedford ranks first in the United States in the manufacture of fine cotton goods and fine yarns,

and ranks second in the number of spindles in its cotton manufactories. All of the New Bedford mills are in a strong financial condition, equipped with the most modern machinery and are conservatively managed. Their securities are widely distributed in New England and can be easily sold.

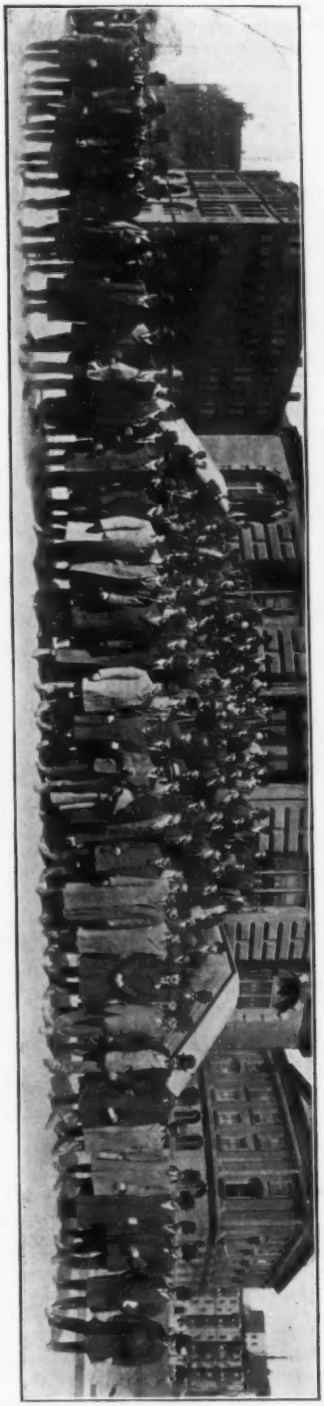
FALL RIVER GROUP.

Fall River, the largest cotton manufacturing sentre in this country, has more than one-seventh of all the spindles in the country, one-quarter of those in New England and manufactures more than three-fourths of all the print cloths. In fifty years, spindles in Fall River have increased, from 250,000 to nearly 3,500,000, with an aggregate capitalization of approximately $26,500,000. I criticise the present system of Fall River cotton mills declaring extra dividends from excessive earnings, which makes the dividend return fluctuate widely. Instead of paying twenty per cent. one year and five per cent. the next, there would be greater stability to the securities, and it would be an act of financial prudence, to declare. say ten per cent. for each year and carry the balance to surplus. Spasmodic dividend paying and bonuses are not justifiable nor consistent with modern financiering. Fall River stocks are not as widely distributed as they should be because of this one fact, which could be easily corrected.

The advantages of a large working capital are self evident, but if a certain piece of legislation proposed becomes enacted, the working capital of cotton mills located in New Bedford and Fall River will have to be materially increased, either by conservation of earnings or by the issuance of new capital stock. This proposed legislation prohibits Massachusetts savings banks from accepting three name paper to an amount exceeding $2,500, unless it be protected by collateral. If mutual savings banks are restricted to this extent, mills will suffer severely. Such loans have played an important part in making Massachusetts the leading textile centre of the Union, and if they are prohibited, it will be little short of a calamity to textile mills. In New Bedford and Fall River, the amount of funds loaned on three name paper by savings banks is about equal in aggregate to the total amount of loans on discounted paper by Boston National Banks and Trust Companies. I feel confident the more conservative banking interests in this state will not permit the enactment of this restriction.

SOUTHERN COTTON MILLS.

Not until after the Civil War were the necessary economic conditions created in the Southern states that would allow the establishing of cotton mills. When the economic progress, which had been throttled for a period of years, again became a fact, cotton spinning and weaving were introduced in the Carolinas. The initial labor force was furnished by the natives of the mountains in Kentucky and Tennessee, who were more or less familiar with hand weaving. Then the families of the small farms and the better class of colored help were educated to the requirements of the industry. Plain goods and the cheaper grades of fancies predominate in the South, although there has been quite a general introduction of the finer counts during the past few years.



A GROUP OF COTTON MANUFACTURERS AT THE CONVENTION.

Southern cotton mills that have paid dividends for the past ten years, with a very few exceptions, have declared comparatively small profits. More at an average of six per cent. annually and under than over, with no extra disbursements to the stockholders from surplus profit, while during the same period in the North, extra dividends have been chronic. I am familiar with negotiations that were pending in 1901 and 1902, for the consolidation of about fifty weaving and spinning mills in North Carolina, South Carolina and Georgia, with a capitalization of $60,000,000, or slightly in excess of $20.00 per spindle. The object of this consolidation was to provide about $10,000,000 of northern money for working capital, which would have placed these fifty odd mills on a sound financial basis, and eliminated, to a large extent, large commissions being paid New York commission houses for the sale of their products and for the advancement of funds. The industrial reaction in 1903 prevented the completion of negotiations. This is the nearest approach to a cotton manufacturing trust that has ever been contemplated in the South. Southern mills, as a whole, are well managed, equipped with modern machinery and have many known advantages over northern plants. Their securities are more closely held than northern cotton mill stocks and the market for them is quite narrow, but the first suggestion of the approach of an era of extra dividends and stock bonuses will broaden the market materially.

SECURITY OF COTTON MILL STOCKS.

In determining the security of cotton mill stocks, one of the most important factors is the net quick assets, which are not easily determined on account of the present system of making financial statements, but as a rule in the more conservatively managed, the net quick assets represent about the capitalization. The Bates net quick assets are $200,000 in excess of capitalization; Dwight has quick assets of $1,499,221 as compared with a capitalization of $1,200,000; Pacific has net quick assets of $8,832,000, and a capitalization of $3,000,000; Great Falls net quick assets of $1,460,605, and a capitalization of $1,500,000. In brief, there is dollar for dollar back of every share of capital stock of our prosperous cotton mills, and a far greater percentage of assets than of many railroad and industrial stocks and bonds. Cotton mill stocks are entitled to a place in the lists of savings banks investments, because of their security, and it will not be many years before there is legislation permitting the investment of savings bank and trust funds in seasoned textile mill stocks.

REPLACEMENT VALUES.

Nearly all of our cotton mills are capitalized for a great deal less than the replacement value, notwithstanding their machinery is at a high point of efficiency. It is generally conceded that $17.00 to $18.00 is a fair spindle cost for building a print goods mill today; $22.00 for a fine goods mill, and $25.00 and upwards per spindle for a colored goods mill, and so from these figures one can easily see that the cotton mills are not over capitalized, but on the other hand, are under capitalized. I doubt if any of us would care to duplicate the Pepperell at $10.27 a spindle, the Acushnet at $4.00 per spindle, or the Pacific at $16.67 per spindle, including the woolen department. These are the figures shown in the above table.

FORM OF STATEMENT TO STOCKHOLDERS.

While securing information for my paper, I was requested by several cotton mill treasurers to work out a form of statement that could be adopted by mills that desired to give greater publicity to stockholders. I suggest a table giving the outstanding capital stock for the lifetime of the corporation; the gross earnings per year; the expenses, interest and taxes per year; the net earnings applicable to dividends; the rate and amount of dividends paid per year; the year's surplus after dividends; the grand surplus to date, and the number of stockholders for each year. I believe such a statement combines all of the essential facts that stockholders are entitled to. The present system of issuing reports to the State Treasurer is ambiguous and unsatisfactory to all concerned.

As an illustration, a large Massachusetts mill stated in their list of assets for the year ending June 20, 1907, that their real estate and machinery had a total value of $500,000. Why! I should have no hesitation in offering $5,000,000 for that property and consider it a bargain at that. In analyzing the statements of assets and liabilities of cotton mill corporations made in the state, it is extremely difficult to satisfactorily determine the asset value of the capital stock or the earnings, on account of the many opportunities for covering up sources of equity. This may be all right from a cotton manufacturer's standpoint, to cover up equity and hide earnings, but, from an economic standpoint it is a violation, for which there is little or no justification. In the days when the cotton mill was owned and controlled by a family, there is no question but that secrecy was a desirable and necessary factor, and fifty years ago, when cotton manufacturing and allied industries were partnerships, that might have been justified, but in fifty years the cotton industry has grown from a capital investment of $100,000,000, with a product of $115,000,000, to over $600,000,000 capitalization, with a product value of $450,000,000, and yet we still have the old systems of accounting, of publicity to stockholders and to the public; in other words, the manufacturing end of the cotton industry has made tremendous economic advances, while the financial end has maintained inertia. It is a well settled law that a corporate charter constitutes a contract between the corporation and its stockholders, determining the exact and only purpose for which the stockholders' funds may be employed. Upon this principle of law rests the stability and honesty of management of corporations, and upon it is based the confidence, safety and protection of stockholders.

The other papers read were as follows: "The Arts of Weaving and Spinning," by William B. Weeden, Providence, R. I.; "Egyptian Cotton," by P. N. Caridia, Boston, Mass.; "Sea Island Cotton," by F. G. Schell, Secretary Sea Island Cotton Association, Lake Butler, Fla.; "Heating System of

Mill," by A. G. Hosmer, M. E., Clinton, Mass.

On Friday evening the annual dinner of the Association was held at the Hotel Brunswick. President Hartshorn presided and the following gentlemen made addresses: Hon. Harvey N. Shepherd, Boston, Mass., who spoke on "Forest Preservation." Rev. Frederick W. Hamilton, President of Tufts College, spoke on the proper kind of training to fit a young man for practical affairs. William Whitman spoke on the "Inviolability of Mechanical Obligations."

The closing address was made by Henry Clews of New York, who delivered an exhaustive address on "The Financial and Trade Situation and Prospects."

At the closing session of the meeting on April 17, the following officers were unanimously elected:

President, Charles T. Plunkett, Adams, Mass.

Vice-presidents, George Otis Draper, Hopedale, Mass.; Franklin W. Hobbs, Boston, Mass.

CHARLES T. PLUNKETT, ADAMS, MASS., ELECTED PRESIDENT OF THE NATIONAL ASSOCIATION OF COTTON MANUFACTURERS.

Directors for three years, Robert Beatty, Philadelphia, Pa.; Frederick A. Flather, Lowell, Mass.; Joseph Merriam, Middletown, Conn.

Director for one year, David S. Johnston, Cohoes, N. Y.

The election of new members resulted as follows:

FOR ACTIVE MEMBERSHIP.

Charles H. Arnold, Supt. Grosvenor Dale Co., Grosvenor Dale, Conn.
Clinton W. Atwood, Sec. Williamsville Mfg. Co., Killingly, Conn.
Lewis E. Bentley, Agt. Taber Mill, 252 Main St., Fairhaven, Mass.
James A. Burke, Agt. Lyman Mills, Holyoke, Mass.
Thomas Henry Chadwick, Chairman Soudan Mill Co., Ltd., and others, 35 Edward St., Oldham, Eng.
Charles B. Chase, Supt. Lincoln Mfg. Co., P. O. Box 45, Highland Ave., Fall River, Mass.
Charles E. Collins, Supt. Methuen Co., Methuen, Mass.
Thomas H. Conley, Asst. Supt. Mohawk Valley Cotton Mills, Utica, N. Y.
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CORRESPONDENCE AND NOTES

Upon Textile Topics At Home and Abroad.

THE DRESSING ROOM.

BY C. H. CHISHOLM.

When a new man enters on his duties as overseer of the dressing department, he may find conditions entirely different from what he has been accustomed to. I have in mind my own experience in adapting myself to new conditions, herein described. Orders were filed in the dressing department in bi-monthly deliveries, as was done all through the mill. These orders were written out on a sheet in styles, patterns, cuts and yards, in groups, each group calling for a different kind of yarn. This list was copied in the order book under delivery date. Then I prepared a sheet, Fig. 1, for each group. The method of making up this sheet is illustrated by the aid of the dressing plans, Figs. 2 and 3.

Style	Pattern	Cuts 62 yds	Th'ds in Patt.	Sections Th'ds in Sec.	Th'ds in Warp	Holes	Lbs	4/2 cotton xa Blk.	4/2 cotton xa 128	4/2 cotton xa 510	4/2 cotton xa 240	4/2 cotton xa 242	4/2 cotton xa 205	4/2 cotton xa 210	4/2 cotton xa 200	4/2 cotton xa 232	4/2 cotton xa 160
10005	1	10	106	6/424	2544	62	252	(112) 4.32	(129) 5.12							(16) .4	(10) .16
"	2	20	"	"	"	124	504	(243) 4.48	(259) 5.12							(32) .4	
"	3	15	"	"	"	93	378			(168) 4.32	(168) 5.12					(17) 20	
"	4	25	"	"	"	155	630	(323) 5.12			(280) 4.36				(24) 16		
"	5	30	"	"	"	186	756	(336) 4.36			(388) 5.12						(28) 24
10009	1	10	54	7/594	4158	72.33	403	(90) 3.12	(90) 3.12					(30) 1.04	(60) 1.48		(134) 4.38
"	2	15	"	"	"	108.4	604	(135) 3.12	(202) 4.38		(67) 1.26	(135) 3.12		(45) 1.04	(23) .22		
"	3	25	"	"	"	180.73	1007		(149) 2.08	(28) .22		(224) 3.12	(224) 3.12	(75) 1.04	(112) 1.26	(149) 2.08	(28) .22
"	4	20	"	"	"	144.6	806		(179) 3.12	(30) .22	(150) 2.30		(179) 3.12	(60) 1.04	(90) 1.26		(120) 2.08
				Lbs. Wanted				(1239)	(1008)	(226)	(1053)	(359)	(403)	(210)	(309)	(171)	(320)
				Spools "				30.94	25.94	4.94	25.94	7.94	10.94	5.94	4.94	4.91	6.94
				Holes "				1.16	1.52		789	1.32	1.49	1.42	1.27		1.22

FIG. 1.

Fig. 2: Style 10,005, pattern 1, 2, 3, 4 and 5. The letters represent colors in the pattern. At the end of the plan is the number of threads of each color in the pattern. The total threads number, 106 in this style is found at bottom of column. 2544 ends ÷ 106 (ends) = 24.

24 (patterns) ÷ 6 (sections) = 4 patterns in a section. Multiplying the number of each color by 4 gives the result in the second column, at the bottom of which is the number of threads per section, 424. Following this column is the spooling plan. The spools have each 40 threads putting fractions on pattern spools. Third column, regular spools; 4th column, first pattern spool; 5th column, second pattern spool, etc. The plan of each pattern spool will be easily understood without explanation.

In the column headed "Lbs. per cut" opposite each letter will be found "Lbs. per 62 yds. cut." In working out this I use a table, Fig. 4, which covers only yarns used in this mill. The constants are obtained by dividing yards of number by yards per cut. The constant for 4 run yarn 62 yd. cut will be 103.2 used as a divisor. Color A 192 ends ÷ 103.2 = 1.86 × 6 sections = 11.16 lbs. per cut.

In estimating the number of holes per cut, the constants, Fig. 5, are obtained by multiplying the yards by number of sections and dividing by 60 yds., one hole. For example, 4 (sections) × 40 (yards) = 160 ÷ 60 = 2.66 holes, therefore 6 sections, 62 yards (see table) requires 6.2 holes per cut.

Style 10,009, Fig. 3. The dressing plan is worked out in the same manner as style 10,005.

STYLE No. 10005

	Ends												Total Ends in Section		Sections	Ends in Warp	40 End Spools	Pattern Spools #1	#2	#3	#4	#5	Lbs. cut 62 yds	Holes cut 62 yds
a	2	2	4	4		5	4		5				48	× 4 =	192			4	32					11,160	
β	2	2	4	4		6	5		6				53	" "	212			5		12				12,906	6.2
C					1			1					4	" "	16					16				930	
D							1						1	" "	4					4				156	
		× 2			× 2				× 2																
Totals													106	× 4 =	424	6	2544		32	32				25,152	6.2

Patterns		#1 Shade	#2 Shade	#3 Shade	#4 Shade	#5 Shade	Pattern Spool		Ends									Total Ends
a	4 run × a	Blk	Blk	510	240	Blk	#1	a									32	32
β	" " "	128	128	240	Blk	240												
C	" " "	160	Blk	232	200	160	#2	β		3	3	3	3				12	
D	" " "	232	232	232	240	Blk		C	2	4	4	4	2				16	
								D	1	1	1	1					4	32

FIG. 2.

Let us now make up the sheet at Fig. 1. The headings are, style, pattern, cuts and yards, threads in pattern, sections and threads in section, threads in warp, holes and pounds. Each of the other columns is for a particular kind of yarn and in each block are inserted spools and margins; over spools in each block, pounds. We begin by entering under style, pattern and cuts the orders from the order book. When all are made, reference is made to the book of dressing plans and the sheet is made up, beginning with the first item. Style 10,005, pattern 1, 10 cuts.

By referring to dressing plan, Fig. 2, we find there are 106 threads in the pattern, 6 sections of 424 threads, 2,544 threads in warp. There are 10 cuts wanted and the plan shows 6.2 holes per cut. 10 × 6.2 = 62 holes. The total amount of yarn wanted per cut is 25.15. The 10 cuts × 25.15 = 252 pounds. By referring to patterns in the plan the shades will be found as indicated by the corresponding letters, thus:

wanted, the latter in red ink. In this way we get all orders on file in a form that will enable the overseer to determine the pounds wanted for all shades and kinds of yarn. This is done by taking total holes wanted and dividing to the limit of spool capacity. This gives the holes required. When estimating the holes or pounds, the required allowance cannot be worked out by percentage. I allow from a half to a whole hole on

STYLE NO 10009

	Ends												Total Ends in Section		Sections	Ends in Warp	40 End Spools	Pattern Spools #1	#2	#3	#4	#5	Lbs. cut 62 yds	Holes cut 62 yds
a			2			2			2			2	8	× 11 =	88			2	8					5.9689	
β				3						3			6	.	66			1		26				4.4767	
C	2			2			2			2			8	.	88			2	8					5.9689	7.1233
D	1	1	1	1	1	1	1	1	1	1	1	1	12	.	132			3		12				8.9534	
E	1	1	1	1	1	1	1	1	1	1	1	1	12	.	132			3			12			8.9534	
F	2												4	.	44			1			4			2.9845	
G				2									2	.	22						22			1.4922	
H										2			2	.	22				22					1.4922	
Totals													54	× 11 =	594	7	4158		38	38	38			40.29	

Patterns		#1 Shade	#2 Shade	#3 Shade	#4 Shade	#5 Shade
a	4 ends x a	160	128	232	240	
β	. . .	200	240	200	200	
C	. . .	160	128	128	160	
D	. . .	Blk	Blk	205	205	
E	. . .	128	242	242	128	
F	. . .	210	210	210	210	
G	. . .	200	200	510	510	
H	. . .	160	128	160	240	

Pattern Spool		Ends								Total Ends
#1	a	2		2		2		2		8
	C		2		2		2		2	8
	H	4	2	2	4	2	4	2	2	22 — 38
#2	B	2		2						26
	D	1	12							12 — 38
#3	E	2	2	2	2	2	2			12
	F		1	1	1	1				4
	G	4	4	4	4	4	2			22 — 38

FIG. 3.

A—Black, 4 spools, 32 ends 10 cuts × 11.16 lbs. = 111.6 or 112 lbs.

B—128 shade, 5 spools, 12 ends 10 cuts × 12.9 lbs. = 129 lbs.

C—160 shade, 16 ends 10 cuts × .93 lbs. = 9.3 or 10 lbs.

D—232 shade, 4 ends 10 cuts × .156 lbs. = 1.56 or 1.6 lbs.

We enter on sheet under each color and opposite the order, in lower half of space, the spools wanted; upper half, pounds

all spools whether they be spools of 20 holes or of 100 holes, as the only waste is at the bottom of the spool. One hole extra in 20 would be 5 per cent. if same percentage was allowed on 100 holes we would have 5 holes of a margin. Assume that the spooler spools the exact length, that the dresser measures the exact length. We now transfer to the spooler's book, Fig. 6, the totals at bottom of sheet for pounds, spools and holes. The headings at Fig. 6 are for grade

of yarn, number, shade, pounds ordered, pounds wanted, pounds on hand, pounds over, spools and holes, pile, and dates of delivery. On receipt of first of yarns ordered the second hand puts a cross opposite the color and date. Under "pounds ordered" a record is made of amount ordered, indicating yarn required and deduction for amount on

Number of Yarn	Yds per lb	40 yd. Cut	55 yd. Cut	60 yd Cut	62 yd Cut	
4 run	6400	160			103.2	
5½ "	8400	210		140		
3¾ "	6000	150				
1½ "	2400		363			
2/15 worst.	4200	105				
2/32 "	8960	224				
2/36 "	10080	252				
2/40 "	11200	280				
15/2 silk	12600	315	229			
36/2 "	30240	756	550			
60/2 "	50400	1260	916.3			

FIG. 4

hand. As the yarns of no two deliveries come together, the surplus is recorded in stock book at close of delivery. After entering these items from Fig. 1 I assign to the pile not more than 16 spools per pile. In the spooling room are 2 boards to hold tickets. The spooler's order tickets are placed in these holders. After entering orders in spooler's order book, Fig. 6, the orders are made on spoolers. The first item is:

Shade, black; run, 4; pile, 1, 2, 3.
Lot, ; lbs., 1,239.
Grade, X A; spools, 35; holes, 94.
Spools, 1; holes, 51.

This is carried out for all items making tickets for complete delivery and putting them in the board. All tickets are stamped with delivery stamps. Orders for pattern spools are marked on back of spooler's ticket. The ticket is made out in colors as on dressing plan. Tickets are issued to spooler as soon as the yarn is available. As spools are made and ticketed and placed on pile a record is made on back of order ticket. When finished the ticket is returned to the overseer. The pattern spool tickets go with the spool. The pattern spools have a special pile for each delivery. The weight per hole is found by the aid of the table at Fig. 7, which is made out to meet requirements.

40 (threads) by 60 (yards) = 2,400.
9,600 (yards per lb.) ÷ 2,400 = 25 constant.
.25 × 100 bracket holes = 25 lbs.

Care must be taken to have the drum measure exactly 1 yard in circumference. The rollers are covered with filleting and made perfectly true. The top roller rests on bottom and is weighted at both ends. The holes in the guide are spaced accurately and cut no larger than is necessary. Under these conditions a good spool can be obtained.

Some overseers maintain that open rollers are better for fine yarn. To this I cannot agree. Yarns are never perfect and spinners expect an allowance of 3 per cent. for

Holes per Cut
Use constant as multiplier

Section	40 yd. Cut	55 yd. Cut	58½ yd. Cut	62 yd. Cut	59 yd. Cut	57 yd. Cut
3		2.75				
4	2.66	3.666		4.133		
5		4.583		5.166		
6		5.499		6.200		
7		6.416		7.232		6.65
8		7.332	7.8	8.266	7.866	
9		8.246		9.299		8.55
10						
11						10.45
12						
13						
14						

FIG. 5.

variation each way. In some cases the variation reaches 6 per cent. With open rollers light threads make hollow places when running on the spool. Heavy threads make high places. This results in making the light threads shorter and the heavy threads longer on the spool. When spool is running in the dressing frame the strain comes on the light threads and the heavy threads run in without tension, and as a result the light threads

are made lighter and the heavy threads heavier. Closed rollers bring the strain on the heavy threads. The light threads are carried along with the rollers, thus there is a tendency to make the heavy threads lighter and the light threads heavier. I have had experience with fine numbers up to 7 run and am convinced that the closed rollers are the best.

tween the rollers and the quide. The roll is driven by a chain from the drum shaft.

The dressing frame reel should be driven by two round leather belts. The friction in beaming off is obtained by the use of two manila ropes. The cylinder is driven by a rope. The reel bars are faced with brass plates. The holes are 1/4 inch apart. The creel should hold 16 spools, 8 in the rear

SPOOLER'S ORDER BOOK

Grade Yarn	#	Shade	Lbs Ordered	Lbs. Wanted	Lbs. On Hand	Lbs. Over	Spool Holes	Spool Holes	Pile	At the first delivery of Yarn cross the square opposite shade and under date. 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
X a	4 run	Blk		1239			30.94	1.16	1,2,3	
" "	" "	128		1008			25.94	1.52	4,5	
" "	" "	510		226			4.94		6	
" "	" "	340		1053			25.94	1.89	7.8	
" "	" "	242		359			9.94	1.32	9	
" "	" "	205		403			10.94	1.49	10	
" "	" "	210		210			5.94	1.42	6	
" "	" "	200		369			4.94	1.29	11	
" "	" "	232		171			4.91		11	
" "	" "	160		320			6.94	1.22	11	

FIG. 6.

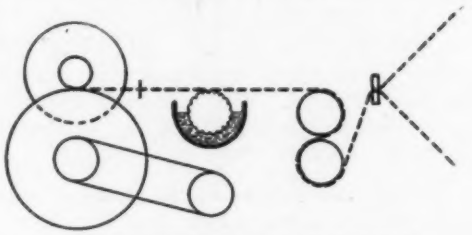
I require that the length called for shall be to the yard and make it a rule that spoolers do not meddle with side roller weights. With the closed rollers I have never had any trouble with the pattern spools.

The waste in spooling woolen yarn should not exceed 3/4 per cent.; on worsted yarn, 1/2 per cent. The cost of spooling 4 1/2 run woolen yarn will average 2/3c. per pound; 2/40s worsted yarn, 1c. per pound.

I have seen very bad spooling done on spoolers fitted with stop motions. The girls relied entirely on the stop motions and laid on these motions the blame for all holes and tight threads. On the other hand the best spooling I ever saw was done on spoolers without stop motions, the operatives exercising great care in running the spoolers. With ordinary help, however, the best results will be obtained by the use of stop motions.

Sometimes it is desired to moisten the yarn in spooling. It is done by using a corrugated brass roll running in a trough partly filled with water and situated half way be-

and 8 in front. The back spools deliver yarn at the bottom and the front spools at the top. The levers are hitched by a flat hook to the rods passing through the center of the frame, and are weighted by flat weights fastened on



YARN MOISTENER AS USED ON SPOOLERS.

top by a set screw, the screw head working in a slot in the lever. The screw enters the hole in the weight. In this way the weight can be adjusted to any point in the slot.

(To be continued.)

It is said that the pay rolls of Allegheny County, Pa., which includes the city of Pittsburg, are $30,000,000 a month.

ENGLISH NOTES.

(By Our Special Correspondent.)

Trade is worse than for a long while. Cotton mills are casting about for any reason to stop or otherwise to reduce outputs. Worsted weavers are painfully short of orders and woolen mills making low goods which have been at the utmost pressure for five years are on the verge of short time. Spinning contracts in cotton, worsted and silk are fast running-off and new ones are almost unheard of.

The violent suddenness of the fall from prosperity makes the case seem harder. There are heavy losses to liquidate in the wool market, for fine material is down 20 per cent., coarse and medium qualities 40 per cent. on the parity of October, with losses of 20 or 25 per cent. in spun silk. Optimists rarely had a more difficult task to get a hearing and the only optimists are those who have not lost money.

Remittances from abroad are bad and recovery is deferred both in Continental and oversea markets, while confidence in the home market is shaken by labor disputes. Yet it is held that there is none too much wool for prospective needs and that trade will presently be tempted into new channels by cheap materials. It is held that cottons will soon be in strong demand again in Asia. Meantime spirits are far depressed by new disclosures of rottenness in prices and markets and ability to finance. But the despondency is too deep and too sudden to be lasting.

* * *

Bad weather has conspired with other influences to spoil spring trade and little is to be said of the success of any novelties. For feminine wear cream worsted serges, mostly of strong wool, are a good line and cream is the color of the season for automobile garments. For the winter the prophecy is a run on moss and reseda greens and on browns. An attempt to restore Wedgewood (or light slate) blue costumes to favor seems already to have frizzled out. Without having had any sunshine deserving mention, garments in this color have faded in the windows already.

Such a color is dyed in weak indigo for army nurses. Some proceed by dyeing to a fuller shade and reducing to match; others by direct means. Certain German army uniforms of similar tone are wool-dyed in indigo and the slate blue effect is obtained by blending the dyed wool with white. However, it is a question whether any means will re-establish a good reputation for Wedgewood blue.

* * *

The lull in cotton spinning is not proving altogether detrimental to mill furnishers. The mills have money enough in hand and during the boom have had to postpone all possible alterations which might interfere with work. Now they are reclothing card rollers and renewing worn working parts more freely than ever. The period of recuperation is being utilized to good account in view of the next demand and men high in the trade talk of a new boom as not more than two years distant.

* * *

The demands of the Yorkshire Textile Workers' Federation are thus summarized, the terms being those that unionists seek to make uniform in the woolen trade: Wages 12 cents an hour; a week of 55 1/2 hours; no overtime; no meal-time work; no piece work and not less than one man to a set of cards. The conditions are better than the average and the meaning of the demand is that the male Yorkshire woolen operative does not get $6.70 per full working week. Perhaps $6 is above the general average for card room and general hands. Recent strikes have been settled on that basis.

* * *

Woolen manufacturers in English districts have lived not unfriendly together but apart, and without organizations exclusively their own to represent their common interest. Chambers of Commerce, of which they are not the only members, are their public meeting-grounds. Differences of products, markets and circumstances, taken with the general weakness of trade-unionism in their industry explain the isolation of the several mills. Now that labor demands are more insistent, associations on the lines of those

in the cotton trade are more obviously needed. One is being founded by the heavy woolen manufacturers who inhabit the pulled-wool region of Yorkshire, of which the center is Dewsbury. The initial object is to obtain uniformity in operatives' wages throughout the district. Ultimately, of course, such an association might aspire to put a curb on a rising rag market, but the wage question is the author of its being.

* * *

General feeling on the new patents law is summed in the words of a color-maker: "The benefits of compulsory working in this country will be more and more felt as time goes on." There is excitement still over the coming of new industries. Municipalities, railway companies and canal companies are all on the alert. Plans of sites are being mailed abroad and owners of disused factories are handing details of their offers to the foreign consulates on this side.

The Bayer combination, which includes the Badische and Berlin aniline concerns, has bought 800 acres in Cheshire and is using 120 acres for itself. A German dyeing firm and a firm of Continental machinists are known for certain to be selecting sites. Men in the color trade particularly are sure that a great employment of labor is to follow.

The German press is very cross with us and calls the change the grossest protection. The law is said specifically to be intended to help British manufacture at the expense of German. The English view is that we simply restate the principle which governed the earliest of our patent laws. Monopoly was given not as a reward for ingenuity but for the value of a new manufacture to the realm.

* * *

A proposal to establish one uniform system of numbering woolen yarn—asked for in the interests of technical education—has been rejected promptly by a gathering of Chamber of Commerce delegates. Not one in a dozen, probably, had even the slightest acquaintance with woolens or with the manifold systems in district use. But on the representation of cotton spinners that education had to adapt itself to trade—and not trade to the requirements of examiners—the proposal fell. Reform in numbering seems to make no headway and presumably for the reason that the yarn of each district is further manufactured in its own district mostly or in areas where the peculiar system adopted is perfectly understood. The reformers are criers in a wilderness.

* * *

Wool twine is an article with a potential future for use in sewing wool bags. Its use is warmly approved by the committee interesting itself in the extermination of vegetable fiber in raw wool. Stronger twine than ordinary hemp has been made from coarse wool and at an extra cost of 40 per cent. Lower prices for wool reduce the excess probably to 15 per cent. and at 30 cents per pound of 450 yards the new material will not be out of all reach. Bags made of wool for use in packing wool have been tried and have thus far proved deficient in strength. Americans with ideas on these subjects, or with samples to send, might do worse than communicate with H. Dawson, Booth St., Bradford, the chairman of this Committee, who is in touch with growers and packers in the colonies.

* * *

Raised blankets look especially handsome in the retail windows when headed by bars of dark green. Blue bars are more usual and there are fanciers of rainbow effects in blue and red. Green has a superior and artistic look and is not yet common. In England the blanket business is dominated by district prejudices. Here, blankets with blue bars are utterly unsalable for fear the blue will bleed or fade. There, none but blankets with red whipping sell. A line can be drawn straight across country to show where Witneys cease to be sold and there are areas that will have only twill or only cloth blankets. The country divides itself into partitions entirely separate and distinct.

This occurring in a country fairly well educated and subject to no great climatic differences should strengthen sympathy with the less instructed races who also have their most definite predilections. We look down on the Chinaman for his attachment to one

packing or color or detail which has absolutely no relation to the value of the goods. The same blind devotion is found at home.

* * *

Scottish manufacturers are defending their exclusive rights to the words "Scotch tweed." To be indeed Scotch tweed, they say, the cloth must be out of Scotch spun yarn, woven in Scotland. At their instance an advertising dealer has been sent to prison for describing Yorkshire cloth as Scotch and mixed cloth as all wool. The legal force of the definition is still uncertain. It is reminiscent strongly of the claims of Scotch distillers to property in the words "Scotch whisky." Various persons in this country have had to suffer for the offence of misapplying names like "Harris" and "Donegal" tweed. The time may come when the Government Department in charge of these prosecutions will be induced to extend its arm abroad. It has been hinted strongly that, given a clear case, German law would be turned on the Germans who mark their knives "Sheffield." No complaints are heard of misdeeds in America, but a case may be recalled in which English manufacturers sought, and failed, to restrict the use of "clays" as a trade name on worsteds in the United States.

* * *

A question asked as to the terms of credit in the English woolen industry is answered by saying that—exceptions aside—the terms are "a clear month." In practice that spells two months. Cloth delivered up to the 20th of May is due for payment about July 20th with 2 1/2 per cent. discount. There are local two-monthly terms, which imply about three months. There are "seasons' terms" under which the manufacturer may have to wait nine months and receives payment only twice in a year. Finally there is the practice of "dating" under which a buyer may get two months' "date" and two months or so of trade credit. The terms are commuted in consideration of getting extra discounts of 1 1/4 per cent., so that regularity of system is the last characteristic of which the trade could be accused even if there were no such documents as bills.

In export relations the terms are more diversified still and classification can only be attempted by countries. Of course some of the stability of British export trade in textiles (which compose half the export of manufactures) comes from the operation of strong merchant houses which deal with good firms oversea on current account. Payments are then made in accordance with rates of exchange as well as with the general balance of amounts due and undue.

ESTIMATING THE COST OF WOOLEN GOODS.

The merchant who acts only as a distributer of goods has no difficulty in determining the cost of his wares. The invoices tell him in plain figures the cost of his merchandise, which, undergoing no change while in his possession, is sold in the same condition as when purchased, with a certainty as to the profit or loss of any transaction.

The manufacturer on the contrary has to face a far different condition. If he is manufacturing woolen goods he must invest in raw material in the form of wool as it comes from the sheep's back in raw cotton, shoddy, waste, fuel, oil, soap, dyestuffs and chemicals, machinery, belting and other supplies. He pays out large sums for labor and in return for this outlay finds in his possession a stock of manufactured woolens of various grades and market values. No clue as to their cost per yard can be obtained from the payroll, or invoices of material and supplies. What the goods cost per yard, how much for raw material, for labor, and for all other expenses are questions that must be met, and upon the accuracy of the answer depends the success or failure of the business. If the manufacturer relies on guesswork or on inaccurate methods of estimating, he may be selling his goods at a loss or holding them at a figure so high as to prohibit their sale. He will then occupy the position of a merchant who ignores the cost in fixing the selling price of his goods. The ultimate result of a business so conducted cannot be a matter of doubt.

It is of the utmost importance to every manufacturer, not only to estimate closely

the cost of his own goods, but that all his competitors should be able to do the same, for the manufacturer who sells goods in ignorance of their cost not only ruins himself but spreads demoralization in the trade and causes loss to all other manufacturers in the same line.

COST OF RAW MATERIAL.

The cost of the material per yard can be more readily determined than the cost of labor and expense, as only three factors are to be reckoned with in the cost of the stock, viz: cost of raw material per pound, percentage of shrinkage in manufacture, and the

Monthly Statement of a 12-set Mill on Dress Goods 36" wide 36 picks

Dept.	Product	Labor	Expense	Average Labor	Average Expense
Sorting	74,765 lbs	299.06		.004	
Scouring	29,906 "	101.68		.0034	
Coloring	29,906 "	221.30	852.32	.0074	.0285
Picking	29,906 "	59.81	86.73	.002	.0029
Carding	148,500 runs	519.75	133.65	.0035	.0009
Spinning	148,500 "	772.20	29.70	.0052	.0002
Spool & Beam	6187 doz.	346.50	13.61	.056	.002
Weave. Day	74,250 yds	534.60	51.98	.0072	.0007
Weave. Piece	74,250 "	1752.30		.0236	
Finishing	74,250 "	816.75	185.63	.011	.0025
Repairs	74,250 "	155.92	51.98	.0021	.0007
Ins. & Taxes	74,250 "		371.25		.005
Fuel	74,250 "	80.19	348.98	.001	.0047
Freight etc	74,250 "		133.65		.0018
General	74,250 "	482.62	155.92	.0065	.0021
		$6142.68	$2415.39		

Dividing the labor cost ($6142.68) by the yardage for the month (74,250 yds) gives us .08 27/100, the average labor cost per yard. Dividing the expense cost ($2415.39) by the yardage (74,250) gives .03 25/100 as the average expense cost per yard — the total for labor and expense being 11 52/100 cents per yard.

FIG. I.

The requirements in estimating cost vary with every mill, and in order to make this article of value to the greatest number, we will confine it as far as possible to a statement of general principles, leaving to each mill owner the work of applying them to his particular needs.

value of the waste products. The fluctuations in the amount of the mill's production do not affect the cost of the raw material.

It is necessary to compile statistics of mill work to show the product obtained from material supplied to each department of the mill, such as the various quantities of each

sort obtained from the wool purchased, weight of scoured or colored stock from materials supplied to scouring and dyehouse, the yarn obtained from picked stock and the quantity of finished cloth produced from goods as they come from the looms. From such records the cost of the raw material in any one of our fabrics is readily calculated.

COST OF MANUFACTURING.

In a mill making but one fabric the labor and expense per yard can be found by dividing the total amount of payroll and expense charges for any given period by the number of yards manufactured during that time. Such a calculation, however, in a mill making two or more fabrics would leave the cost of each fabric unknown. The great variety of goods, varying in quality, weight, size of yarn, number of threads per inch and in finish made in the same mill complicates the calculation of the cost of manufacturing each fabric. A mill may have several classes of goods in process at one time, some requiring careful sorting of the raw material, while others are made from stock as it is received; some stock dyed, others piece dyed. Under such conditions a system must be adopted that will fairly apportion the expense among the different grades of goods.

To do this we must first determine the cost of each process. This can be done only from the records of each department, carefully collected during a period of at least six months, when the department was operated at its full capacity. These statistics are the basis of our calculations. They not only furnish us with the facts on which to base the cost of each of the fabrics, but also with a clear statement of the work in different departments of the mill. They should be compiled monthly; these monthly reports will prove invaluable to the manager of a mill, showing him at a glance whether the department is doing its work at a greater or less cost than in former months, and indicating the effect of any change of machinery, help or methods. A form for such a monthly statement will be found at Fig. 1.

Monthly Statement of Fixed Charges of a 12-set woolen mill on Dress Goods 36" wide, 36 picks

74250 yds 36 inch goods, 36 picks = 26730 yds. 3/4, 50 picks

Dept.	Product	Labor	Expense	Average per yd. 50 picks Labor	Expense
Weaving	26730 yds	534.60	51.98	.02	.002
Repairs	"	155.92	51.98	.006	.002
Int. & Taxes	"		371.25		.014
Fuel	"	80.19	348.98	.003	.013
Freight	"		133.65		.005
General	"	482.62	156.92	.018	.006
		1253.33	1113.76	.047	.042

FIG. 2.

Each department has its own unit of production, such as the pound of stock for the dyehouse, the run of 1,600 yards of yarn for carding and spinning, the yarn for weaving, etc. The average cost for each department is found by dividing the total cost by the production.

The fixed charges, such as fuel, freight, insurance, taxes, etc., must necessarily be averaged on some arbitrary plan. The department of the mill with the lowest capacity of production measures the production of that mill, and accordingly the production of that department is used as a basis for calculating the average of the fixed charges. As yarn can be and generally is, purchased to keep the looms running full, the weaving department in most cases serves well for this purpose. The goods usually vary widely in the number of picks per inch and consequently

in yards produced and this weaving product must, consequently, be reduced to an equivalent yardage with a constant number of picks per inch. Let us for illustration take 50 picks as a basis, with a product in a given month of 10,000 yards, averaging 40 picks per inch. The equivalent of this product in 50-pick goods would be 8,000 yards. If in another month the product should be 5,000 yards, averaging 80 picks per inch, the equivalent would again be 8,000 yards of 50-pick work. This reduction of the yardage makes the report much more valuable for comparing the operations of the mill during different periods.

When estimating the cost of any particular grade, we must figure the cost of each process through which the fabric passes. A good method consists in calculating the quantity of material which must pass through each of the necessary processes to produce one cut of the goods. For example, we find that a cut of cloth which measures 45 yards finished, may require 200 pounds of wool to be sorted, 70 pounds of clean wool to be colored, 100 pounds of stock to be picked, 250 runs of yarn to be spun, 55 yards of warp to be dressed, and 50 yards of cloth to be woven and finished. Each of these items is extended at the average cost of the process, fixed charges being calculated per woven yard of 50 picks per inch. The total of these items divided by 45 (yards of finished cloth per cut) will give the estimated cost per finished yard for labor and expense. If the cloth is made with a greater or less number of picks than 50, the average used for fixed charges is increased or diminished in corresponding proportion.

There is but one proof of the accuracy of

Cost Estimate of Woolen Cassimere.

15½ oz. per yd 4/4

2800 ends, 3⅞ runs; 68" wide in loom, 50 pks. 3⅝ runs

Stock shrinks 15% from clean wool to yarn

15% " yarn to finished goods.

21⅞ oz. stock required for yard, 424 lbs; .562 cost of stock

	Required per cut	Manufacturing Labor	Manufacturing Expense	Cost per cut Labor	Cost per cut Expense
Sorting	156 lbs	.004		.62	
Scouring	63 "	.0034		.21	
Coloring	63 "	.007	03	.44	1.89
Picking	63 "	.002	.003	.13	.19
Card. + Spin.	221 "	01	001	2.21	.22
Spool. + Dress	7 sets	.056		.39	
Weaving Pc.	50 yds	.089		4.45	
Finishing	47 "	.036	.023	1.69	1.08
Fixed	50 "	049	.042	2.35	2.10
				12.49	5.48

	Cost Stock per yd	.562
12.49 / 47 yds	" Labor "	.266
	Expense "	.116
5.48 / 47	Mill cost per 4/4 yd	.944

FIG. 3.

any cost estimate. When an inventory is taken and mill accounts closed, the yardage of the various fabrics manufactured during the period should be extended at their estimated cost, and the total compared with the actual cost as shown by the statement of profit and loss.

Fig. 2 is a statement of the cost for fixed charges as indicated by Fig. 1, but reduced to a basis of 50 picks. The actual monthly production was 74,250 yards, 36 inches wide, 36 picks. As the goods were woven two widths in the loom the yardage was one-half this amount, or 37,125 yards, 36 picks per inch. Assuming these looms to have been operated with the same efficiency on a cloth having 50 instead of 36 picks per inch, a proportionately less yardage would result. A simple calculation gives 26,730 yards of 50-pick goods as the equivalent. As already explained, this reduction is made for the purpose of having a standard of production by which to calculate the average cost per yard of the so-called fixed charges, and by which to compare the product of different months. One yard of goods containing 50 picks per inch is the standard by which the work of the mill is measured and the efficiency of its operation determined.

Two important items of cost, interest and depreciation, do not appear in our statement, and have been omitted because they vary so widely among different mills. Care should be taken to allow for them in estimating the cost of goods.

Fig. 3 illustrates the method of estimating the cost of a particular fabric. This estimate was based upon the averages obtained from Figs. 1 and 2. The different items of cost are first placed in the left-hand column; in the next column appears opposite each item the material or work required for one cut. In the next two columns are the cost averages for labor and expense. The total cost per cut for each process is then extended and placed in the columns at the right. These items are then added and the totals taken as the estimated cost of labor and expense per cut.

The average cost per yard is found by dividing the total cost of raw stock, labor and expense by the finished yards per cut. These three items are in turn added and the result is the estimated mill cost of the fabric per yard.

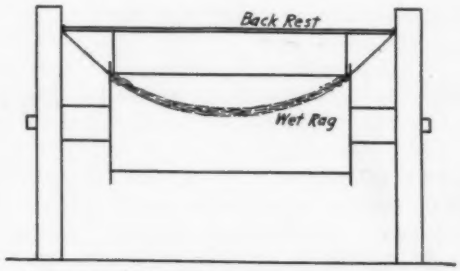
HUMIDITY IN TEXTILE MILLS.

The following letter was written in reply to our request for criticism of the editorial article in the February, 1908, issue entitled "Humidity in Textile Mills":

Darwen, England, Apr. 6, 1908.

Editor Textile World Record:

I have carefully looked over your article on "Humidity in Textile Mills" and find only one error. It is in your explanation of "Wet Rags" on page 71. A better explanation of this method of moistening is as follows: "Wet Rags" is an English method of moistening yarn in the weaving shed. The "wet rags" are made from waste yarn twisted in the form of a rope about one inch in diameter and as long as the weaver's beam is wide. The waste yarn is soaked in water. After squeezing the surplus water out the "wet rags" are laid across the yarn behind the back rest. Each end of the "wet rag" is tied with a piece of string to the frame of the loom so as to keep it in position, as shown in the accompanying sketch.



"WET RAGS" FOR MOISTENING WARPS IN ENGLISH MILLS.

Yours very truly,

F. Scarisbrick.

There are 120 knitting mills in Canada operating 4,313 machines.

Canada has 14 carpet factories operating 726 looms and in 1906 bought from Great Britain carpets to the value of $4,639,085, being the largest customer for this product.

Questions and Answers

Under this head we undertake to answer, free of charge, to the best of our ability, any pertinent inquiry pertaining to textile matters received from any regular subscriber to the TEXTILE WORLD RECORD. Questions should be stated as briefly and concisely as possible. Inquiries pertaining to textile processes, machinery, improvements, methods of management, the markets, etc., are especially invited, as well as any legitimate discussion on the views expressed. All inquiries must be accompanied by the name of the person inquiring ,not for publication, but as an evidence of good faith.

For reply to questions that are not of general interest to readers of textile journals, such as those relating to the composition of yarns, analysis of fabrics, etc., we will charge the enquirer with the cost of the investigation.

Production of Cotton Machinery.

Editor Textile World Record:

If a fine speeder or jack frame was run continually for 58 hours without a stop, turning off 50 hanks, what per cent. of loss should be allowed for doffing, piecing up broken ends, cleaning, etc.?
Hartford (989).

The percentage of efficiency usually obtained from the machines in the preparation processes for cotton yarn is among the most variable items in the mill. On similar goods the production may vary considerably, owing to the conditions under which the machines are run. The following, however, will give an approximate percentage under average conditions: On fine speeders or jack frames a production of 90 per cent. is considered satisfactory when running below 8 hank; from 8 to 15 hank, 92 per cent. may be obtained; and over 15 hank roving from 92 to 95 per cent. should be obtained under good conditions. On intermediates the per cent. of production is usually about 90 per cent., while on slubbers the weekly product will vary from 83 per cent. to 90 per cent. of theoretical production, depending upon stock used and hank slubbing being made.

Drawing frames usually give from 75 to 80 per cent. of possible product, and this is determined by the care given to setting the various stop motions in addition to the quality of stock being worked.

Combers will give from 90 to 95 per cent. production, and the ribbon lap machine about 90 per cent., while the sliver lap machine is considered satisfactory if 70 per cent. of the theoretical production is obtained.

The cards should under good conditions give 95 per cent. production, if continuous running is considered, not including time lost in grinding and setting, but including stripping.

When making allowances for the pickers, it is customary to consider 50 hours as one week's work, because these machines can be made to accommodate a wide range of work. With the above allowance, the production would represent from 84 to 85 per cent. of a week's possible production on a basis of 100 per cent. being the theoretical amount for 58 hours.

In the spinning room from 93 to 95 per cent. production is expected under favorable conditions. Bolster.

Setting for Cards.

Editor Textile World Record:

In the answer on "Setting for Cards" by W. S. on page 117 of your January issue the following statement is made: "If the flat stripping is too heavy the front plate should be set a little closer to the cylinder and away from the flats; if too light, set closer to the top flats."

I and doubtless many others would read with interest the reason why and how such a change in this particular setting will change the amount of flat strips; and, also what percentage of waste is usually taken out by the flats, and how much this can be varied by changing the position of the front plate. Interested (969).

In reply to "Interested" the change in the position of the front plate changes the draft or air current. This affects the amount of strips taken out by the top flats. It would be impossible to say just how much of a change can be made at this point. The strip may be changed from a very light one to a very heavy one.

To get the best results the plate should be kept well up between the cylinder and the top flats. If the plate is too low much good fiber will be taken out with the strips. With the plates properly adjusted the strips from the different flats should be held together by just a few fibers between them. The weight of the individual strips may be from 15 to 20 grains each.

The percentage of strips taken out will vary widely with the class of cotton and amount of sliver produced. The following table will give an idea of the percentages with strips of different weight and varying production per week, top flats running 3.5 inches per minute.

Production	15 gr. strip	18 gr. strip	20 gr. strip
300 lbs.	3.8%	5.6%	6.2%
500 lbs.	2.9%	3.4%	3.8%
700 lbs.	2.0%	2.5%	2.7%
900 lbs.	1.6%	1.9%	2.1%

W. S.

Oxidized Fast Black on Hosiery.

Editor Textile World Record:

Please give me a good working formula for oxidized fast black on hosiery, lisle finish.

Bradley (968).

The following formula has been used for many years in a large Western knitting mill with good results.

Dissolve in tank 1:

40 lbs. Bluestone,
30 lbs. Chlorate Potash,
12 lbs. Salammoniac,
6 lbs. Verdigris.

Make up to 40 gallons or 20° Tw.

Dissolve in barrel 2:

130 lbs. Aniline Salts.

Make up to 40 gallons or 16° Tw.

Barrel 3 is used for stock solution.

Make up with equal parts from barrels 1 and 2 and dilute with water to 14° Tw.

It requires some experience to color aniline black and a beginner should first experiment with recipe on a small lot or sample as goods are liable to be tendered.

The usual method of dyeing aniline black on hosiery is as follows: The stockings should be put in a tom-tom and pounded from 45 to 60 minutes; when nearly dry put them into oxidizing cages and run at 100° F. until they are a good dark green. When they are taken from the tom-tom they are colorless. After oxidizing the stockings are aired on racks. After airing over night they are chromed with 5 per cent. chrome solution at 120° for about 50 minutes and then treated in a dilute soap solution.

For lisle finish oxidize 5 hours at 100° F., cool to 90°, run 5 hours longer, then chrome as usual and soften with an olive oil emulsion, which is made up as follows:

35 lbs. Olive Oil Soap,
19 lbs. Olive Oil,
15 lbs. Lard Oil,
1½ lbs. Carbonate of Soda.

Make up to 50 gallons and for every 100 lbs. of hosiery use 2 gallons of the solution at 120°.

Many dyers are now obtaining the lisle thread effect by singeing as the result is the same. The stockings are oxidized long enough to burn all the loose fibers and leave them bare and glossy. To obtain good results in lisling the stockings should be well knit and made from a good quality of yarn.

For experimental purposes it would be well for the beginner to make a pail of stock solution and pound say half a dozen stockings or so; extract, oxidize and chrome. Working with care one can be sure of results and save much trouble and expense.

Baumwolle.

Which is the Right Hand of a Textile Machine?

Editor Textile World Record:

Suppose you wanted to designate whether the driving pulley of a machine is on the right hand end or on the left hand end. Would it be generally understood which side of the machine you were standing to designate right or left hand? There seems to be some diversity of opinion on this point between American and foreign practice.

Benton (975).

Stuart W. Cramer, Charlotte, N. C., gives the following information in regard to the "hand" of textile machinery.

"The foreign and domestic practice in regard to the designation of the hand of different machines are diametrically opposite. Generally speaking, in America the observer stands facing the front or delivery end of the machine, noting whether the driving pulley is on the right or left, and designates the 'hand' of the machine accordingly; abroad the custom is usually just the opposite, and the observer stands facing that part of the machine into which the cotton is fed.

"It is well to point out, however, that in the case of picking machinery the question even in this country is in doubt. Lappers are generally built only one way, as the countershaft is overhead attached to the machine; at the same time, it is the custom for picker shops to face the feeding-in end of the machine and to term the parts to the left of the observer 'left hand' and those on the right hand side of the machine 'right hand.' Cards, drawings, sliver lap machines, ribbon lap machines, combers, slubbers, intermediates, roving and jack frames, quillers, warpers, slashers, looms and reels, all follow the regular American custom of designation. Spinning frames, spoolers, twisters, winders and other two-sided machines are of course not referred to either as right or left hand; but for the convenience of reference, the driving end is termed the head end and the opposite end the foot or tail end.

"In cloth room machinery the custom is again uncertain, and the hand of the machine is usually reckoned from the 'feeding-in' end (where the cloth enters), when referring to inspecting machines, sewing machines, brushers, shearers, calender rolling machines, singeing machines, etc.; on folders it is usually reckoned from where the operator stands,—as on gray goods the cloth is generally fed in from the back of the crank shaft, while on finished goods it is fed in from back of the operator."

Rolling of Goods on the Finishing Machines.

Editor Textile World Record:

I would like to have you advise me as to the cause and remedy for the rolling of our goods in the washing and dyeing machines. I enclose sample of the fabrics, which are broadcloths weighing 8 1/2 ounces; shrinkage, 7 per cent. in length; fulled from 68 to 50 inches in width. The warp is right twist, filling left twist, 38 picks per inch. We also make worsted broadcloths having 3,600 ends, 54 picks and woven 70 inches wide in the loom, finished 54 inches with a mohair listing. We are having trouble with all of these goods, but only at intervals. Sometimes they will go all right and then suddenly begin rolling to the size of your arm. The filling is steamed three minutes. The listing is woven with two threads in an eye.

Guide Eye (990).

The rolling of these goods is caused by the listing threads not being sufficiently stayed or spread wide enough apart to give them room to lie in proper position during the process of fulling, which on this class of goods is continued to some extent in both the scouring and dyeing processes after they leave the fulling mills. When the goods begin to roll from this cause it is impossible to remedy the difficulty in any of the later processes. They will be in bad condition, especially after dyeing, as the rolling with its accumulated felt will prevent the penetration of the dye liquor. The reason for this trouble only appearing at intervals, is that the weaver will at times carelessly and improperly draw more than the prescribed number of listing threads through the single eye. The overseer of weaving should be made acquainted with these facts and have the loom fixers and weavers instructed to guard against this mistake. Rigo.

I have been having the same difficulty with my goods that "Guide Eye" complains of and found the following to be of much service: Be sure and soap evening in the fulling. Tack the pieces before fulling as close to the edge as possible, leaving the tacking in until after they are scoured. Roll them through hot water on rolling machine well weighted down, letting them stand over night on the roll. In the morning reverse the roll end for end and let stay for two or three hours. Then unroll and nap.

Housatonic.

There are several causes for goods rolling. One may be that the listing is too narrow, which could be remedied by laying the list out one-third wider. The listing may also be too tight, or probably there is not enough space between the cloth and the list. It is often found that the list will full faster than the cloth. Wilton.

The Geyser Water Heater.

Editor Textile World Record:

On page 623 of your February issue you mention that the Geyser water heater will save fuel in the matter of dyeing and is more economical than the old process of heating water. Will you please let us know the scientific reason for this being a better process than the old way? It seems to be a very simple device and we should like to know where the saving of fuel comes in and why it is so.

Memphis (985).

The scientific reason why this heater is an advantage over the plain steam pipe is probably due to the following theory:

When steam is injected into a volume of liquor through a plain steam pipe considerable of the efficiency or heat units of the steam is utilized in energy in overcoming the resistance due to the pressure of the water, this resistance being continuous, no circulation being maintained. With the use of the Geyser water heater, however, the steam is inserted through a barrel somewhat in the manner of an injector, the impetus causes the water to flow through the barrel tending to leave a vacuum behind it, which is replaced by water from other portions of the tank, thereby making a thorough and rapid circulation. In short, the full thermal value of the steam is used for heating and not converted into energy.

The manufacturers state that many practical tests warrant the conservative estimate that a given volume of water can be raised to about 15 per cent. higher temperature with these heaters than with a plain steam pipe under the same conditions, or the same volume of water can be raised to a certain temperature in about 75 per cent. of the time.

Cost in a Small Hosiery Mill.

Editor Textile World Record:

We are running a small hosiery mill in a Western town. Can we get a looper from some of the hosiery centers who can loop 25 dozen 200 needle ladies' lisle hose per day and at what wages?

Can we get a girl who can welt and mend 25 dozen per day and at what wages?

Can we get a person that can board, strip and press 25 dozen per day and at what wages?

Boygan.

I infer from the above questions that the present production of the hosiery mill is only 25 dozen a day. With only this small production it would be extremely difficult to get even experienced help, so that the cost per dozen to manufacture would be as low as for a larger daily production. I once had help from Philadelphia who looped from 35 to 40 dozen a day of 10 hours, of 208 needle ladies' hose, and the price paid was 5 cents per dozen. At this price the girl earned from $1.75 to $2.00 per day, which is what an experienced looper expects. "Boygan" could obtain an experienced looper who could do the 25 dozen per day all right, but being able to earn not less than $1.75 she would want at least this wage for doing the 25 dozen, which would thus cost the manufacturer 7 cents a dozen instead of 5 cents.

It is generally found that a girl who is experienced on one line of work is not much better than an inexperienced hand when put on another line of work. Even if the experienced looper should do the 25 dozen in part of the day, she could not be used to advantage for another part of the work, except to help on the mending, folding or packing in case the regular girls on these different jobs were absent.

One girl could both welt and mend 25 dozen per day, provided one could be procured who was experienced on both these jobs, which I doubt. An experienced welter can welt from 75 to 100 dozen a day and the price paid is 2 cents per dozen. An experienced mender (except on seconds) can do from 40 to 50 dozen a day. The price paid is 3 1/2 cents a dozen for fine work, down to 2 cents a dozen for coarser and heavier work.

The price for piece work for boarding and stripping is 2 cents for ladies' plain hose. A young man to do this would want from $1.50 to $1.75 per day, and the pressing should not cost over 1/2 cent a dozen. One experienced man at $1.50 or $1.75 a day would not only board, strip and press 25 dozen per day, but he should also be able to do all the packing and shipping as well.

For a mill producing only 25 dozen per day the experienced help, not including the office, engine and dye room, should be as follows:

1 knitter	$1.50 per day
1 looper	1.75 per day
1 welter and mender	1.50 per day
1 boarder, presser and shipper	1.75 per day
1 for inspecting, folding and boxing	1.50 per day

These make a total cost of $8.00 per day for 25 dozen or 32 cents per dozen. The regular prices paid for piece work on this class of hose foot up to 25 cents per dozen.

A manufacturer making only this small daily production must expect the cost to be greater even with experienced help.

Lafayette.

KNITTING DEPARTMENT.

For Knitting Mill Machinery, Equipment and Supplies, see pages 235 to 253. Also Buyers' Index.

THE KNIT GOODS SITUATION.

It is understood that a great many buyers of underwear expect to visit the local market during the month of May and there are grounds for hope that there will be some business done on heavy weight goods, as well as duplicating on spring lines, the spring business, of course, depending upon the weather conditions for the next few weeks.

Considerable speculation is now being indulged in as to the outcome of the coming fall season. It looks as if there had been only about 40 per cent. of a normal season's purchasing, and as a consequence, there has been a curtailment of production during the past four months. Many predict that there will be a shortage of merchandise during the months of July, August and September. While this has been talked of for some time, there seems to be no disposition on the part of any manufacturer to make up stock to take care of this shortage.

Prices on all lines of ladies' ribbed goods have been reduced since February first and the conditions are such as to deter buyers from operating freely very far in advance. This condition will, of course, continue as long as the prices of raw material continue to decline. This makes it very difficult for the manufacturer to contract for raw materials or to compute his costs.

Ladies' seven pound carded yarn ribbed goods may now be had from some New York State manufacturers as low as $2.00 and seven pound extra sizes at $2.10. Both the tuck and fine stitch combed goods to weigh eight pounds are being offered freely at $3.50, and with hand trimmed vests at $3.67 1/2 to $3.75.

From conversations had with several jobbers, we should judge that up to the present time, they have booked on the average about half as many orders, as up to this time last year.

The Avalon Knitwear Co. have issued a circular letter to the trade, reducing their prices on the Setsnug cotton vests and pants in ordinary sizes to $3.50 and extra sizes to $3.75; on the suits in ordinary sizes to $7.00 and extra sizes to $7.50. They have also changed the restricted jobbing price to $4.25 and $4.50 for vests and pants, and $8.50 and $9.00 for the combination suits.

The situation on men's fleeces remains unchanged. Standards are held fairly well at $3.75, although it has been ascertained that some lines have been sold as low as $3.62 1/2. The lighter weights are offered at $3.12 1/2 and upwards.

Men's ribbed goods that opened at $3.75 have been reduced during the past month as low as $3.50, although most of these lines are being held at $3.65.

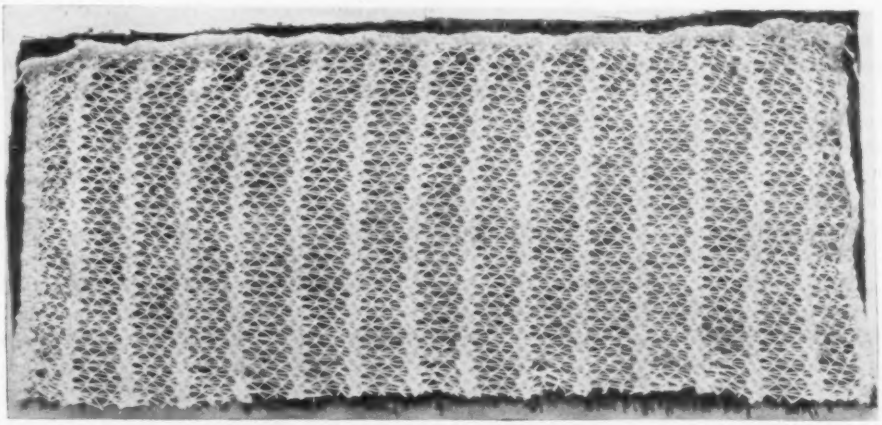
The production of boys' fleeced goods seems to be fairly well taken care of. There is a decreased number of manufacturers of this class of goods in the market this season and notwithstanding this, some material reductions have taken place since the market opened. The Perry Knitting Co. have reduced their prices on the six pound garment from $1.65 to $1.55 on size 24 and on their seven pound garment from $1.77 1/2 to $1.65.

The line of children's fleeced goods running in sizes from 16 to 34 have also been cut in price and a very creditable line may now be had at $1.00 for 16 inch, rise 25c., less 20 per cent. and 5 per cent. Children's straight ribbed goods in the same scale of sizes are now quoted as follows: 4 1/2 pound on size 28 at 50c., rise 25c., less 20 per cent.; 5 1/2 pound on size 28 at 75c., rise 25c., less 22 1/2 per cent.

The weather during April was not conducive to a good spring underwear business and stocks are not as yet broken up to any great extent. Nearly all lines of summer goods are now being offered at reduced prices in an effort to keep the mills running,

but there seems to be no disposition on the part of buyers to place any orders for light weights. Their efforts are devoted to getting out from under heavy stocks now on hand, and the indications are that this is a year when all will try to clean house, and that stocks will be reduced to a low level when the season is over.

The Artistic Knit Goods Co. are showing something new in the way of a fabric for ladies' summer garment. It is made in ribbed lace knit combination suit and gives promise of becoming quite popular. It is known as the "New" garment and was designed by Madam Post. It is made from mercerized yarn, trimmed with durable Val and Torchon lace, low neck, sleeveless, with extra wide lace trimming at the knees. They get to the retailer at $18.00, $30.00 and $42.00 per dozen. We illustrate herewith sample of the cloth.



A NEW KNIT FABRIC.

Men's balbriggans weighing 4 1/2 pounds sold last July at $2.12 1/2 are now offered as low as $1.85. Combed balbriggans sold early at $3.62 1/2 and $3.75, may now be had as low as $3.40 and 3.50.

HOSIERY.

The situation in hosiery looks slightly more encouraging during the past three weeks. Buyers have shown more of a disposition to buy, both for spring and fall, and that without any very great concession in prices. Fleeced hosiery have been fairly active and we learn of some liberal orders having come forward on some of the more well known lines. Fall weight cottons are still being held up somewhat but it is expected that this business will be well taken care of during the coming month. German manufacturers are showing an increased interest in this market and agents are hard at work, soliciting orders at M4.40 on lines that have been held firmly for some time at M5.20.

Stocks of plain black goods are heavy in most quarters and little interest was shown in stock lots at very low prices that were offered a few days ago. It is a tan season in good earnest and anything in the way of medium shades in tan in men's, women's or children's goods are held at full prices. We learn of some plants that have been kept quite busy for several weeks past dyeing white goods over to tan.

Many new designs in fancy hosiery are being shown, perhaps one of the most striking of which is the Swastika pattern. This is shown on black grounds and also in different color combinations. Extreme novelties in very wide stripes with vivid greens and light blues in contrast are being shown. A few plaids are in evidence; also some very pretty floral designs. Whites are being taken fairly well, but are not as popular as last season. A few orders are being placed on laces, although the patterns are nearly all a repetition of patterns bought in former

seasons. Embroidered goods are getting somewhat slower, the trade taking plain colored goods instead.

GLOVES.

Business on fabric gloves has been fairly steady for the past month. Some few duplicate orders for two clasp cashmeres have come to hand, but they are of small volume.

A number of jobs in long silk gloves have been cleaned up, and while stocks are heavy at the present time, there is a good demand and it may be there will yet be a scarcity of good desirable lines.

At one time last season, it was possible to sell almost anything in long gloves. When the craze was at its height, many lots of German goods were ordered out. After the craze was over, it was found that there were in many importer's hands, lots of ill fitting, poor quality, badly dyed goods, and there are still some of these lots to be cleaned up.

The domestic manufacturers are getting many calls for colored gloves and there is a good demand for them from the importers to match up importer's lines of black and whites. Black gloves are not in as high favor as last season, while whites appear to be more in demand.

Parisian reports show the abbreviated sleeve again and indications go to show that 16 and 20 button length gloves will be good for another year. Of course, there are many tailor made suits being worn and these call for wrist length gloves.

Clamping Knit Goods.

Editor Textile World Record:

Will you kindly inform me whether or not there is a successful process for clamp dyeing knit fabrics, or any process which will produce sharply defined edges between the dyed and undyed portions of such fabrics? Kenworth (986).

In all my experience in dyeing knit goods I have never seen any goods clamped during knitting in order to get two colored effects. "Kenworth's" question, however, set me to thinking and as I had not much to do at the time I clamped about 25 yards as an experiment with 2 to 4 inches between each clamp. After estimating the time it took to clamp the piece and noting the results obtained I came to the conclusion that clamp dyeing on knit goods is a failure. I do not see any object in the process. The goods must be knit in the grey and whatever effects are desired can be obtained by dyeing skeins in random colors. Using clamps is simply a waste of time, material and labor.

Winthrop.

I do not know of any successful process for dyeing two color effects on knit goods by using clamps. Short effects can be produced by dyeing the yarn in the form of especially prepared skeins. The skeins are divided into three strands and the ends tied to keep these parts in position. The sections are then braided tight, after which the yarn is boiled out, washed and dyed. This will give a colored and white shot effect when knit into cloth. The skeins are thrown into the kettle like raw stock and stirred occasionally. Wool or mixed yarns can be dyed in this way without injury to the stock. I have also used the block system, which gives a longer pattern. The blocks or clamps are made of wood with slight grooves and with wooden screws in the center of the skein. The part to be left undyed is placed between the blocks and clamped as tight as possible. A stick is placed across the kettle so as to keep the blocks in position. When dyed the clamps are loosened and the skeins reversed for dyeing another color on the same skein. Some mills have special reels to make skeins of different lengths, from 4 to 14 feet. One-half of these are dyed the desired color, and are held in position by a block and tackle, giving a longer pattern. This system is used chiefly in glove and mitten mills.

There are other methods such as tying skeins in knots, but I have found the braid or block system more satisfactory. With a little experience a man can obtain good results.

Devon.

The population of the United States in 1800 and in each decade thereafter to 1900 has been in even millions, 5, 7, 9, 12, 17, 23, 31, 38, 50, 62, 76. In 1906 it was 84 millions.

In 1850 the total wealth of the United States was estimated at 7 billions of dollars, and in 1904 at 107 billions; this is equal to $307 and $1,310 per capita respectively.

THE MANUFACTURE OF BRAIDS IN THE UNITED STATES,

BY FERDINAND THUN.

(Continued from March.)

Fig. 119 shows an eight line, 4-thread lace machine, consisting of eight sectional courses. The engraving shows the machine with part of the carriers removed in order to show the carrier courses more clearly. It will be noted that each of the sectional courses consists of three race-ways in such a way that each sectional course will produce a resident braid, when the switches are closed. This machine is of the table driven type. The clutch gear shown in the rear of the machine engages with the table driving gear in the same manner as has been described in connection with plain braiders. A special feature of these lace braiders is the crown beater, which is so arranged that its prongs have a radial movement towards the braid former as the common center. On account of the zigzag movements and crossings of the threads, it is necessary that a device of this kind be employed to cooperate with the selvage needles and assist in the braid forming operation. On machines of this kind, the power for driving the crown beaters is generally obtained through an auxiliary shaft in the rear of the machine, as is clearly shown in the engraving. The two change gears, which are shown disconnected in the cut, are in mesh with each other when in operative position. By changing these gears the speed of the crown beater can be regulated.

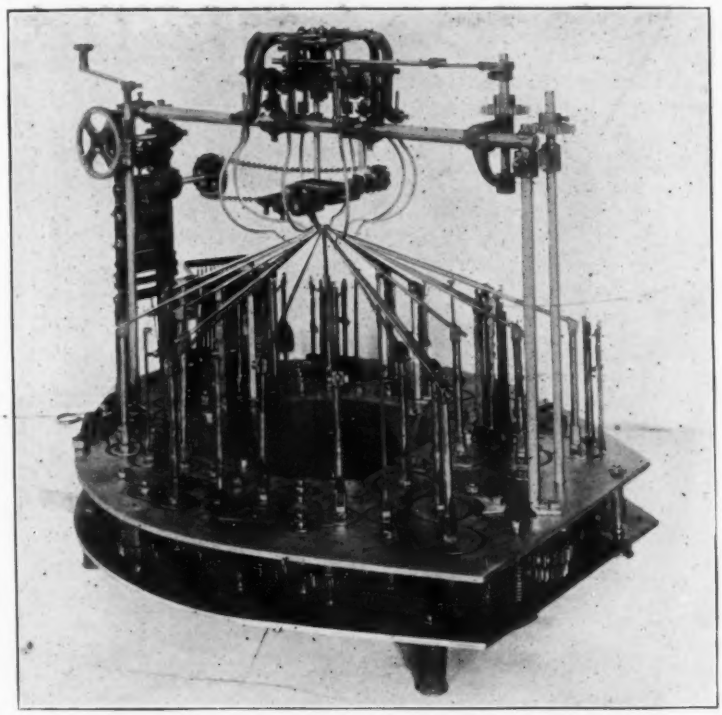


FIG. 119.

Another feature of these machines is the auxiliary take-up. This is driven by the main take-up roller stand by means of a sprocket chain and consists of two corrugated brass rollers, which are placed immediately above the braid former. This take-up is necessary because the tensile strength of most of the lace fabrics that are made on machines of this kind would not be sufficient to stand the strain of the long pull

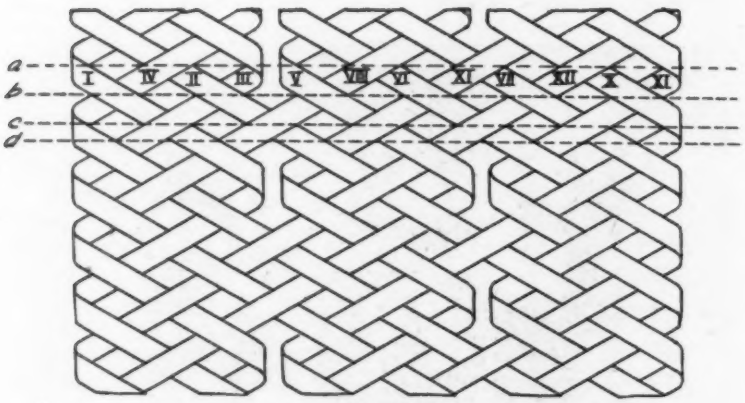


FIG. 120.

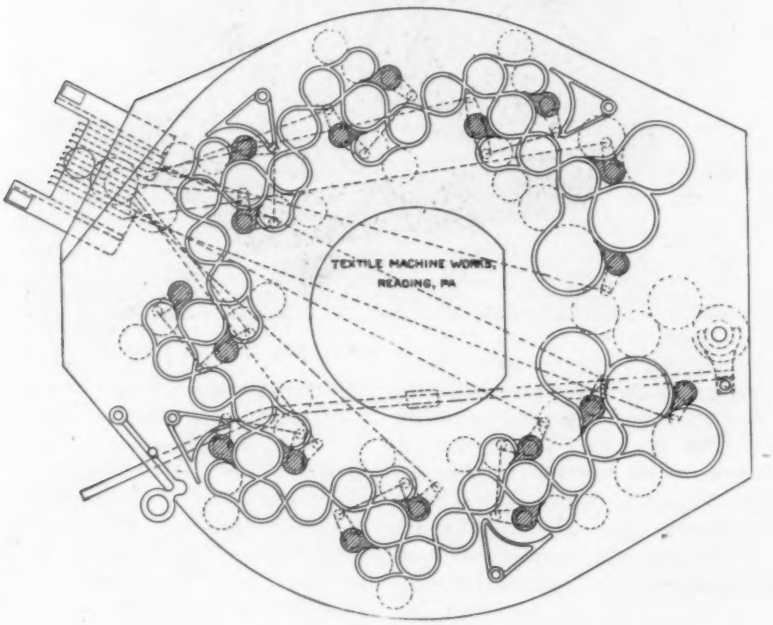


FIG. 121.

from the main take-up roller stand to the braid former. By using the auxiliary take-up the part that is under tension is reduced to a few inches and the lace fabric is practically slack between the auxiliary and main take-ups. The latter is used only to convey the lace to the receiving cans.

Fig. 120 is a view of a 4-thread lace ma-

chine of three lines. The general construction of this diagram corresponds with the construction of the 8-line machine shown in Fig. 119. It will be noticed that all the gears with the exception of the two end gears and the sidetrack gears have two

modated by each section of three gears. The twelve carriers of a 3-line, 4-thread lace machine are shown in their respective positions and are numbered I, II, III, etc., consecutively. By projecting the position of these carriers, we develop a diagram of the

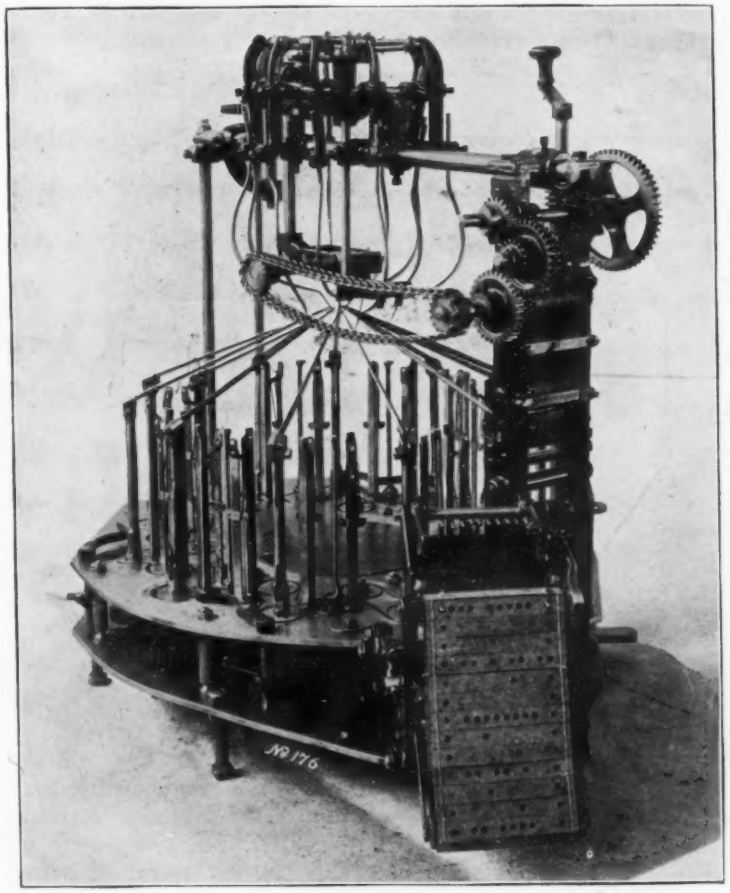


FIG. 122.

horns. The end gears or terminals (i and i), are provided with three horns. The sidetrack gears, b, c. g and b, have also three horns, but they are placed so closely to the adjoining 2-horn gears, together with which they form a compound race-circle, that the combined number of horns is three. It will thus be seen that the combined number of horns in the sections comprising the first, second and third race-circles is eight in each section and that four carriers will be accom-

resulting fabric in which the Roman figures show the location of the carriers corresponding to the plan view of the machine at the sectional line, a.

If we refer to the arrow marks and assume that the gears are all turned in the direction of these marks for a space corresponding to that from one horn to the next, then the resulting location of the carriers will be as shown at sectional line, b, of Fig. 120.

Another movement of the carriers for the space of one horn results in the position shown at sectional line, c, etc. It will be noticed that each group of four carriers remains on its sectional course as long as the switches, a, remain closed. In the position shown at sectional line, a, the switches shown nearest to the carriers III and V are closed, while the switches nearest to the carriers VII and IX are open. Resulting from this constellation of the switches a crossing of the carriers VII and IX occurs at the moment these switches are passed and these two carriers exchange their positions in the two adjoining sectional courses. As soon as carriers, VII and IX, have passed the switches, a, they are closed again by the action of the jacquard mechanism, as will be seen by referring to sectional lines, b, c and d. It will be clear from this diagram that two switches always have to open at the same time to let two carriers pass and exchange their position and that each opening of the switches results in a crossing of two carriers between two adjoining sections.

Referring again to Fig. 119, it will be observed that the general arrangement of the race-circles of the eight sectional courses corresponds to that in the diagram shown in Fig. 120. The plain 3-horn terminals shown in the diagram are the center terminals shown on the photograph, whereas the two side-track terminals shown on both the inside and the outside of the main race circles are used for producing loop edges, as shown on the patterns at Figs. 105, 107 and 109 in the preceding article.

In Fig. 121 a line cut shows the construction of the 8-line, 4-thread lace machine as built by the Textile Machine Works and illustrates the arrangement of the gearing. This line cut corresponds exactly with the machine shown at Fig. 119. The position of the switches and their connection to the jacquard mechanism shown in the diagram is clearly indicated by this cut. The dotted lines showing the switch connections show that all the switches which regulate the passage of carriers from one section to the next are connected in pairs so that they always have to operate together. The end switches, however, that govern the passing of the carriers over the side-track terminals for the purpose of producing loop edges are connected independently.

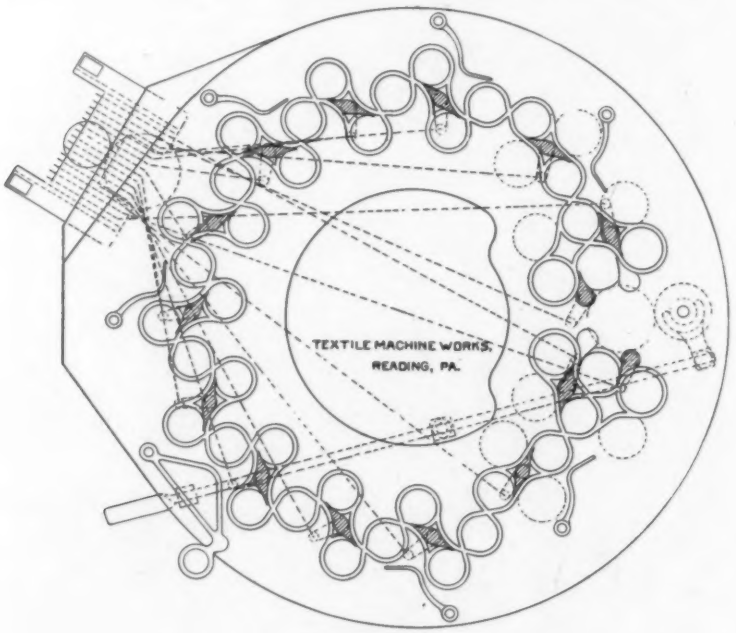


FIG. 123.

Fig. 122 is a 10-line, 2-thread lace machine

and shows more clearly some of the essential features of this class of braiders; namely, the jacquard mechanism in front, the auxiliary take-up and the crown beater attachment.

The 2-thread lace machines are the most important sub-class of lace braiders because of the fact that only two carriers are used for each line. The fabric resulting from this construction is more nearly like the real or hand made lace than the fabric made on the machines previously described. The 2-thread lace machines are also smaller in diameter for a given number of lines than the 4-thread, and the arrangement of the gears allows of a more compact machine.

In Fig. 123 a plan view showing the gearing of a 12-line, 2-thread lace machine is shown. The general arrangement of this corresponds with the 10-line machine shown in Fig. 122. Each sectional course or line consists of three gears. The switch operated connections between each two adjoining lines are so placed that the carriers pass from the last gear of one section to the first gear of the adjoining section, two carriers always passing at the same time and exchanging their positions. The manner in which this is done will be more clearly illustrated by referring to the diagram in Fig. 124.

In this diagram a 3-line, 2-thread lace machine is shown and, as is customary in views of this kind, the gears are shown arranged in a straight line. All the gears are 2-horn and each section consists of three gears. I to VI show the location of the carriers as corresponding with the sectional line, a, in the projected diagram of the fabric. The switches at (a) between carriers, I and IV, are closed and the carriers return therefore upon their own courses. The switches at (a) nearest to carriers, III and VI, are open and, therefore, these two carriers exchange their places in the two adjoining courses and cross over from one course to the other, as is shown at sectional line (a). The sectional line (b) represents the position of the car-

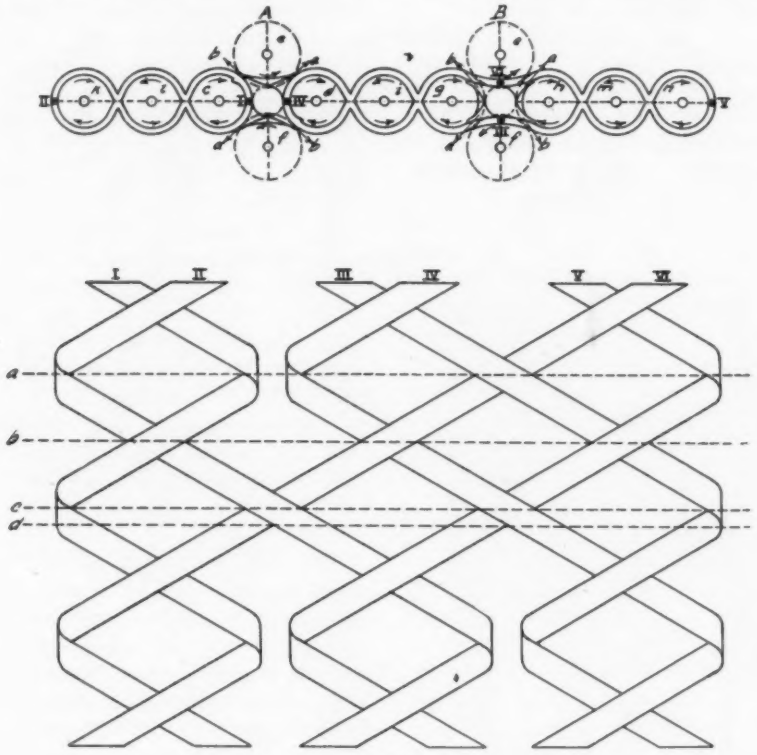


FIG. 124.

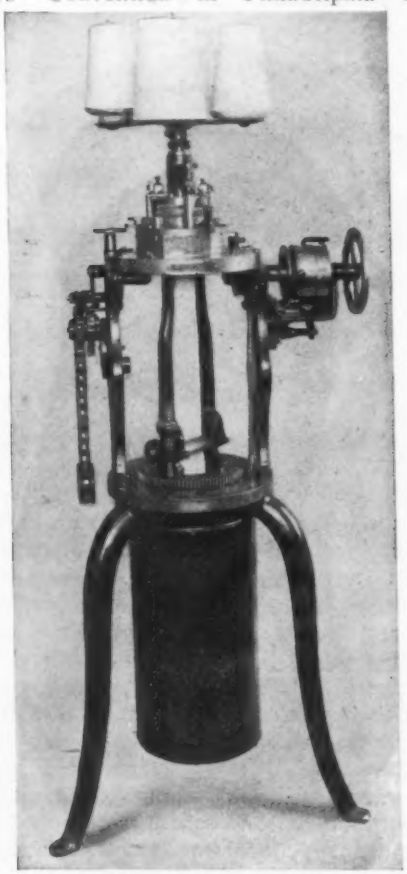
riers after all the gears have made half of a revolution and the carriers have traveled the distance from one horn to the next. At the sectional line (c) a crossing of the carriers from section one to section two and from section two to section three is shown which indicates that all four switches must be open.

In the same manner the most complicated designs may be analyzed and the working of the switches determined. The punching of the cards is done in a manner very similar to that described in connection with radium or bi-circle machines.

(To be continued.)

THE NEW "TWENTIETH CENTURY" DOUBLE ACTING RIBBER FOR UNDERWEAR AND HOSIERY.

At the Hosiery and Underwear Manufacturers' Convention in Philadelphia this month there will be exhibited in operation a new circular ribbed knitting machine which is the invention of H. B. Taylor, brother of James Taylor, 121 Arch St., Philadelphia, the well-known knitting machine dealer. Mr. Taylor, who has had long experience in all kinds of knitting machinery, believes that this is one of the cleverest inventions of recent years in the line of circular knitting machinery and has given it careful test for nearly two years with a view of eliminating all the weak spots and overcoming any objections that might develop in practical use. The most striking claim made for this machine is its great production. Mr. Taylor states that while the belt does not travel any faster and the bobbins or cams do not revolve any faster, nor does it contain any more or less feeds or cams than the ordinary machine, yet it will knit just twice the number of yards of fabric. In other words, ten of these machines he claims will produce the same number of yards or dozens that twenty are usually required for. The economy in floor space, power and operating expenses is apparent.



JAMES TAYLOR'S NEW RIBBER.

Manufacturers are invited to inspect the machine in operation in Philadelphia and see for themselves whether or not these claims are borne out.

The United States patent has recently been granted and the foreign patents have been applied for. We understand that at the present time Mr. Taylor's plan is to offer the patents for sale, but if arrangements are not made shortly, he will build the machine himself and place it on the market.

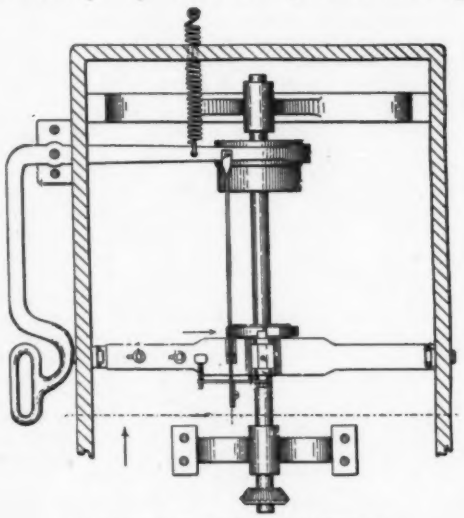
A BRAKE FOR KNITTING MACHINES.

An automatic brake specially adapted for knitting machines has recently been patented in this country and is shown at Fig. 1, applied to the knitting table. The following description of the brake is given by the inventor:

The drawing shows only one end or half of the said table and the driving shaft for one of the circular frames. The table has on its under side a box-like flange to which any suitable legs may be secured in the ordinary manner. The bearing for one end of the shaft may be mounted on the legs at the

ends of the table, while the other end of the said shaft is mounted in a box on the bracket that is secured to the under side of the table. The shaft is also provided with a bevel gear for engaging a bevel gear and vertical shaft not shown, for driving the circular frame. The shaft is provided with fast and loose pulleys for the driving belt.

A shipper is formed or mounted on one end of the shipper lever for shifting the belt from one pulley to the other, the lever being



A BRAKE FOR KNITTING MACHINES.

pulled or operated in one direction by a spring connected at one end to the shipper lever and at the other end to a fixed support. The shipper is shown in Fig. 1 in a position to shift and hold the belt on the loose pulley When the operator pulls the shipper lever handle forward, the belt is shifted to the fast pulley and the spring is put under increased tension, so that it will pull the shipper lever in the direction to shift the belt to the loose pulley as soon as the shipper lever is released.

In practice the shipper lever is secured in position for holding the belt on the fast pulley and is automatically released upon the breaking of a thread. The attachment to this old machine consists of a cross arm, with parts mounted thereon, the arm being secured to the under side of the table, a friction brake mounted on the driving shaft and an operating bar or slide connected to the shipper. The cross arm is provided with an extension slide adjustably secured by a bolt and slot connection, so that it may be contracted or lengthened to fit frames or tables of varying widths. Its ends are provided with lugs by means of which it may be bolted or otherwise secured to the flanges underneath the table, and a little above the shaft, as shown in Fig. 1.

The friction brake is in the form of a ring, having one or more stop arms, the ring and arms being frictionally mounted on a hub and plate that are made fast on the shaft.

The ring is recessed to receive the friction spring or shoe that bears on the periphery of the hub within the ring and the friction of the spring on the hub may be adjusted by means of the set screw in the ring. This friction brake is mounted on a shaft by one side edge of the cross arm, as shown. Upon the cross arm a sliding bolt is mounted transversely to the arm, one end of the bolt being connected with the plate, while a spring is arranged between the plate and cross arm with a constant tendency to force the plate away from the cross arm and move the sliding bolt so as to withdraw its ends from engagement with the stop arms of the brake.

KNIT.

New Mills.

*Massachusetts, Great Barrington. The Reliable Knitting Co. is nearly ready to start manufacturing. Some of the new machinery has already arrived, and the plant of the Reliable Mfg. Co. of Canaan, Conn., which was absorbed by the new Reliable Knitting Co., has shut down previous to removing the equipment to this place.

*New Jersey, Camden. The Nelson Manufacturing Co., recently reported by us as starting up a plant at 516-18-20 Point St., for the manufacture of knit goods, bathing suits, coat sweaters, eiderdown sacks and wrappers, are gradually getting their plant under way. Their sewing machines have been put in and the knitters, it is said, will be put in at a later date. They expect to have the plant in operation now at any day.

New York, Cohoes. The Putnam Knitting Company has been incorporated by John H. Murphy and Mary E. Murphy of this place and Catherine E. Godfrey of Schenectady. The authorized capital stock is $10,000.

*North Carolina, Hope Mills. The new knit goods manufacturing company will be known as West & Bullard. Construction work on the new

plant began March 15 and it is expected manufacturing will begin about June 1. Men's half hose and ladies' hosiery will be manufactured on 14 knitting machines at first. It is expected that this number will be increased soon after manufacturing begins. A gasolene engine will be installed to supply power. The new industry will give employment to about ten persons.

*Ohio, Dresden. The New Capital Knitting Co. which originally proposed to occupy a plant at Columbus is building a plant in this city and will start manufacturing about the middle of May, giving employment to twenty or thirty hands. The initial equipment will consist of ten knitting machines. A gas engine will be installed to supply power. Men's half hose is the only product. H. W. Moler is treasurer and J. W. Shaw is superintendent and buyer. A piece dyeing department will be equipped.

Pennsylvania, Ariel. J. W. Sandercock of this place and associates of Scranton, have formed the Lake Ariel Knitting Company and will equip a plant for the manufacture of underwear. The underwear machinery operated by the United States Knitting Co. of Hawley has been purchased and will be shipped to this place and set up at once. The price paid the Hawley company for machinery is given as $5,000.

*Pennsylvania, Philadelphia. The Guarantee Hosiery Mills, recently started here, leasing the top floor of 730 West Girard Ave., have at present no machines in operation. They are having their goods, consisting of special line of half hose, made by other knitters on commission. The officers of the company are H. M. Durant, pres., and F. F. Durant, treas., both being connected with the firm of H. M. & F. F. Durant, 396 Broadway, N. Y., where they are selling hosiery on commission.

Pennsylvania, Philadelphia. The Logan Hosiery Mills, 4945 Wakefield St., Germantown, has recently been started up with Joseph F. Gee as manager. They are operating 40 knitters, 4 ribbers, 1 welter and 3 loopers on men's and women's seamless cotton hosiery, 176 to 200 needle goods. They buy 12s to 24s combed yarns on cones. The production of the plant is sold direct. They report a good business.

*Pennsylvania, Rothsville. The new Rothsville Knitting Mills have awarded contract to the Brown Engineering Co. for the mechanical and electrical equipment of the hosiery mill being erected. A. J. W. Baker, treasurer of the Rainbow Hosiery Co. of Reading is president of the Rothsville Mills. Men's and women's cotton hosiery will be manufactured.

Enlargements and Improvements.

*Connecticut, Addison. The Glastonbury Knitting Co. has decided to build an addition to its wash room and also to erect during the summer a new dye house.

*Connecticut, Paducah. The Wisdom Hosiery Co. has nearly completed the improvements decided upon when the new company took over the plant of the Dixie Mills. The dye plant is being equipped to use the sulphur black process in the future. Robert B. Phillips is the secretary and H. F. Drenk is the superintendent.

Connecticut, Poquonock. The frame work of the new stock house which the Dunham Hosiery Co. is building has been raised. A short time ago a new concrete floor was laid in the dye house. The company has made a number of improvements since taking over the Poquonock plant, which was formerly occupied by the Health Underwear Co.

*Georgia, Atlanta. It is understood that machinery contracts have not been awarded for the new equipment of the Atlanta Hosiery Mills. It will be remembered that this plant was destroyed by fire some time ago and is being rebuilt. Samuel A. Magill is president and buyer.

*Georgia, Rome. The Rome Hosiery Mills advise that no information regarding plans for their new mill can be given out. At the present time no plans have been made and there is a feeling that enlargements will not be undertaken for possibly a year or more.

Maryland, Hagerstown. It is reported that parties interested in the Hagerstown Silk Mills are also interested in the new Antietam Hosiery Mills which have recently been started in this town. It is their intention to also install a dye house to be used in conjunction with the hosiery mills.

Massachusetts, Ipswich. The new four-story knitting mill for the Ipswich Mills, for which plans are now being made by Charles T. Main, mill engineer and architect, Boston, is to be of somewhat irregular form, 246 feet long, 76 feet wide at one end, and 125 feet wide at the other. It will be of standard mill construction, and will replace the original 45 by 90 foot, 5-story stone mill built fully one hundred years ago. The machinery will be mechanically driven from a 500 h. p. engine located in a new engine room.

*New York, Norwich. The Norwich Knitting Company has added 20 sewing machines, a new napping machine and a steam press. As previously reported, the capital stock will be increased from $25,000 to $50,000 and further improvements made.

*North Carolina, Burlington. The increase of $5,000 in the capital stock of the Whitehead Hosiery Mills is to give additional working capital and to provide for the installation of 10 new knitting machines, making the equipment 60 knitters. 10 ribbers and 10 loopers. J. W. Murray, president; R. H. Whitehead, treas., manager and buyer.

*Ohio, Cleveland. The Forest City Woolen Mill Co. of this city, manufacturers of shoddies and extracts, has bought the buildings in Dresden, Frazeysburg and Zanesville, formerly occupied by the Kapner Brothers and Duga Hosiery Co., and will operate them on hosiery and yarns in connection with the main plant at Cleveland. The main office will be at the Cleveland plant. The increase from $100,000 to $200,000, in the preferred stock, and from $150,000 to $250,000 in the common stock of the Forest City Woolen Mill Co. is to provide for this enlargement of the company's operations. T. Epstein is president, George Vonderau, treasurer, and Henry Balbian, general superintendent and buyer.

Pennsylvania, Reading. The East Penn Hosiery Company is installing additional machinery.

*New York, Cohoes. The building at the corner of Oneida and Saratoga Sts. is being torn down to make room for the new Fuld & Hatch yarn mill. Particulars of the new mill have been given previously.

*North Carolina, Lexington. The Yadkin Knitting Mills, recently reported destroyed by fire, will not be rebuilt until fall. The loss is given as $21,000, with $14,000 insurance.

Pennsylvania, Bloomsburg. The Bloomsburg Knitting Mills, Barger, Bain & Munn, props., will add a number of knitting machines. The plant is working to its full capacity on orders which are on hand.

Pennsylvania, Philadelphia. The Hagar Hosiery Finishing Works have leased quarters on O St., above Westmoreland, which they have equipped for the finishing of hosiery and report a good business.

Pennsylvania, Philadelphia. The Liberty Bell Hosiery Mills, 4318 Frankford Ave., manufacturers of women's seamless hosiery and infants' fine striped and fancy hosiery on 60 knitters, on which they have been very successful and for which they are now receiving many orders, report that they are now arranging for the production of a fine line of infants' wool goods for which they are receiving quite a demand and expect to have their samples on the market within a few days. They sell direct. The officers of the company are Ernest C. Locke, pres. and mgr., and S. B. Dingley, sec. and treas.

Pennsylvania, Philadelphia. The Philadelphia Knitting Co. has succeeded to the business of the Friedman & Neiman Knitting Co., who succeeded the Art Knitting Mills, located at 337 S. 2d St. Messrs. Friedman & Neiman are still the owners of the plant, having removed it to 56 North 7th St., where they are operating 14 flat knitting and 10 sewing machines by hand and electric power on sweater coats and fancy knit goods, selling direct.

*South Carolina, Walhalla. The enlargement at the plant of the Oconee Knitting Mills will bring the plant up to a capacity of 600 dozen pairs of hose daily. As reported last week the capital stock has been increased from $30,000 to $50,000 to finance the proposed enlargement. J. F. Roberts, general manager, is in charge of the improvements.

Tennessee, Madisonville. It is reported that the Madisonville Knitting Mills intend to largely increase the plant. At present 50 knitting machines are being operated on cotton hosiery.

Washington, Seattle. The Saxony Knit Goods Company is increasing its cash capital by $15,000 and putting in additional Grosser flat knitting machines, which will double the capacity of the plant.

Mills Starting Up.

Michigan, Adrian. The Adrian Knitting Co. has resumed full operations after a shut down lasting since the first of the year. During the idleness important improvements were completed.

Rhode Island, Woonsocket. The Glenark Knitting Co. has started up some of its machinery after a complete shut down lasting several weeks.

Facts and Gossip.

Illinois, Springfield. The Central Knitting Mills have been incorporated with capital stock of $5,000 to manufacture underwear and hosiery. R. F. Brady, William Osborne and H. L. Strohm are the incorporators. It is understood that a plant will be operated in Chicago.

Massachusetts, Lowell. The Tremont and Suffolk Mills have purchased a few knitting machines from the Pickering plant for the purpose of experimenting along the lines of knit goods to use up some of the knitting yarns which they manufacture. The product will be coarse cotton underwear. H. D. and H. E. Pickering will look after this new department and if it is successful they may expand that branch gradually with a view of large production in the future.

*Michigan, Ypsilanti. The Union Trust Company, receiver for the Ypsilanti Underwear Co., advises that reports to the effect that the Ypsilanti plant had been bought for $40,000 by a new company which proposed to continue the plant in operation, is incorrect. Up to the present time no plans have been made for starting up the plant.

New York, Brooklyn. Bryan, Gastiger & Co. has been incorporated with capital stock of $10,000. John H. Bryan of Hoboken, Louis C. Gastiger and Philip Matty of Brooklyn are the incorporators. It is probable that the new corporation will take over and operate the plant of Bryan & Gastiger at 408-10 Ferry St.

New York, Utica. Notices have been posted in a number of local mills to the effect that wages will be reduced ten per cent. beginning April 13.

North Carolina, Durham. The Durham Hosiery Mills, Inc., has reduced wages 10 per cent. in its two mills.

*Pennsylvania, Doylestown. It is reported that Harvey Sheatz, who recently purchased the plant of the Doylestown Hosiery Mills, which was sold out at a receivers' sale, has in contemplation the formation of a new company to take over and operate the mill. The plant under its former management contained 75 knitters and 100 ribbers, which were operated on women's and children's seamless hosiery, which they bleached, dyed and finished.

Pennsylvania, Philadelphia. The plant of the Quaker City Knitting Co., 10th and Diamond Sts., manufacturers of sweaters, tams, toques, etc., which has been shut down for some time, will be put up at public sale on April 21. The plant contains machines of all kinds for the manufacture of this class of goods.

Rhode Island, Providence. Rudolph Berry has transferred his interest in the Vesta Knitting Mills to New York parties. The price has not been made public. The Vesta Knitting Mills are capitalized at $200,000 and operate 6 sets, 25 spring needle and 125 latch needle knitting machines, and 150 sewing machines on ladies' and children's cotton and wool underwear.

New Machinery and Processes.

This department is designed to present from month to month a brief mention of new machinery, devices and processes being brought out in this country and abroad, that are of interest to textile manufacturers. It is not a list of patents, but of improvements coming on the market. The idea being to present to our readers a systematic monthly record of new machinery etc., of interest to textile mill men.

We invite machine builders and others to send us such information for this department.

Bobbin Winder. J. K. Altemus, 2816 North Fourth St., Philadelphia, is bringing out a new model of his well known skein winding machine for winding filling yarn from cops to shuttle bobbins, which has some important new features.

The points for which especial merit are claimed are very high speed without injury to the yarn, bobbins hard wound in every part, and containing a greatly increased amount of yarn so as to minimize the cost of rewinding cops and bring it down to a very low percentage. The builder offers to place a machine on approval or to wind sample bobbins from yarn submitted by manufacturers either from cop to bobbin or from bobbin to bobbin.

Fiber Cloth Boards. The advantage of smooth, perfectly finished cloth boards is so apparent to every cloth buyer that it needs no argument, but unfortunately many mills are still using a cheap, rough wood cloth board which is really an imposition on the buyer, as there is almost always some injury to the cloth on the last few wraps. A fiber cloth board is being put on the market by the Frontier Supply Co., 47 Christiana St., North Tonawanda, N. Y., which is claimed to overcome these objections and at the same time is very light and strong.

Hard Waste Opener. Tomlinson, Ltd., Soho Ironworks, Rochdale, England. An improved opener for cotton yarn waste. It is equipped with pedal feed motions, loop forming apparatus and cone feed regulators.

Stacking Wool Bales. P. Hughes, Geelong, Victoria, Australia, has perfected a machine for stacking wool bales. Mr. Hughes has had 23 years' experience with the wool house of Dalgety & Co. at Geelong. His machine has been constructed and subjected to tests in the warehouses of this firm, where it is now in successful operation.

Cloth Expander. Pickup & Knowles, Cobden St., Pendleton, Manchester, England. An improved cloth expander having three stationary bars, the flexibility being obtained by spiral springs and an outer covering of india rubber.

Yarn Reel. Max Cohl, Chemnitz, Germany. An improved reel for testing the size of yarn and which is claimed to be more accurate and convenient than anything heretofore placed on the market.

Cloth Guide for Finishing Machines. C. G. Haubold, Jr., Chemnitz, Germany. An attachment for finishing machines by which the operative can move by means of a lever the truck from which the cloth is being drawn into the machine, thus keeping the piece running in the desired position.

A Regulator for Fallers. The Saechsische Maschinenfabrik, Chemnitz, Saxony. A device for self operating mules by which the fallers are adjusted during the winding process so as to regulate the tension and give the desired results.

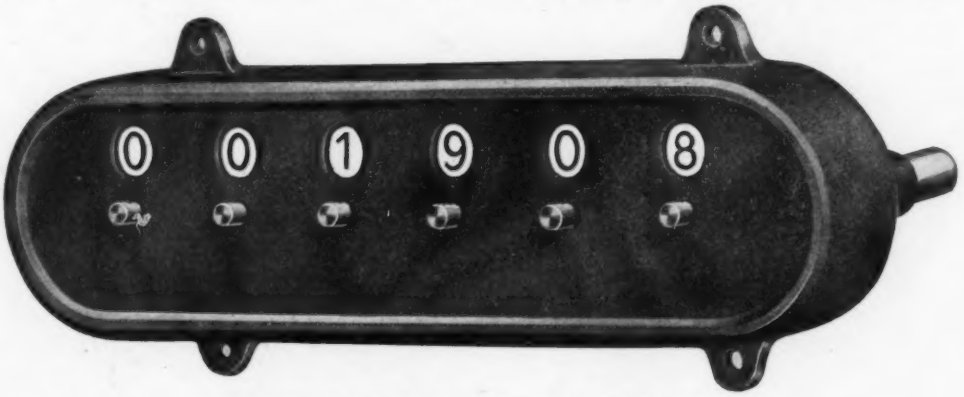
Hosiery Scouring Machine. Samuel Pegg & Son, Leicester, England. A continuous scouring machine which, it is claimed, will handle 45,000 pounds of hosiery a week.

Singeing Machine. Arundel & Co., Stockport, England. An improved gas singeing machine for yarn, which it is claimed possesses important advantages over the machines now in general use.

Take-Up Motion. Clegg Limited, Burnley, England, are introducing a take-up motion for looms possessing some novel features. No change wheels are required. It is claimed that any pick or fraction of a pick can be woven, while the picks per inch are shown on a dial.

COUNTING MACHINES IN TEXTILE MILLS.

The use of counting machines outside of textile mills is familiar to everybody. Probably the best known applications are on the printing presses, to indicate the number of copies coming from the press, and in street cars, to show the number of fares collected by the conductor. In textile mills counting machines of various forms have been in use for time immemorial and are now an indispensable adjunct in nearly every department of the industry. For example, the clocks on drawing and spinning frames are really



A COUNTING MACHINE FOR TEXTILE REQUIREMENTS.

counting machines so adjusted as to count the number of hanks of roving or yarn of a given length. The measuring dial on the cloth perch counts the number of yards passing over the roll. The simple form of counter such as is used on printing presses and in street cars has been used in textile mills to indicate the strokes of the engine, the revolutions of the main shafting and water wheel and for similar purposes.

During recent years they have been adopted for indicating the production of textile machines. On winding, folding and printing machines in textile works they indicate the yards delivered. More recently they have been adopted for indicating the production of looms, the weavers' wages in some cases being calculated from the results indicated by the counter. They have been employed for this purpose for many years in European mills, particularly on the Continent, where it is a general custom to pay weavers by the thousand picks instead of by the length woven. There is much to be said in favor of this method. It obviates the difficulty encountered in paying by the length on conditional take-up looms such as are used for weaving woolen and worsted goods, where there is a constant temptation for the weaver to leave out picks. The weaver is paid for the picks that should have been put in, when as a matter of fact a less number have been woven. Paying for the actual picks woven as indicated by a counter would remove this motive for weaving goods light and would give a fair basis of calculation for both the employer and the weaver. In cotton mills counters are used to a considerable extent on looms, being adjusted so that each unit of the counter indicates a given number of picks, say 10, 20, 50, 100 or any number desired. Not only does the counter give a basis for calculating wages, but it indicates to the overseer or mill manager the production of the machine and enables a comparison to be made with the theoretical production and the machine's efficiency determined.

Many other uses for mechanical counters in textile mills will occur at once to the reader's mind. They can be used for indicating the production of driers and scrutchers in the finishing department, and it is not improbable that they might be applied to woolen cards to indicate the hanks of roving wound on the spool. In this case some simple means would have to be devised for

throwing the counter out of action when the drum was running without roving. Every woolen manufacturer will recognize at once the great value of readily determining the daily production of the card, something that is impossible at present.

We show an illustration of a counter used in textile mills which is manufactured by the

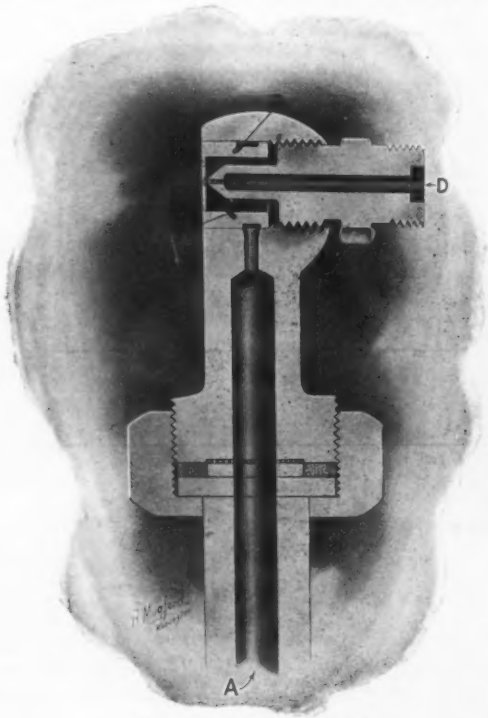


FIG. 1. TURBO HUMIDIFIER.

C. J. Root Company, Bristol, Conn. This company has manufactured counters for various purposes for many years and has acquired an enviable reputation on account of the durability and accuracy of their machines. They have acquired a large trade with textile mills as a result of the unsolicited demand, and as a result are now giving special attention to this branch of their business. They are ready to adapt their counters to any conditions and solicit correspondence with textile manufacturers who may desire to employ counters in their mills.

They are also giving the question of cost special attention so as to make it possible for these useful machines to be applied where a very large number would be required, as in the weaving department. Owing to the importance of the question we advise textile manufacturers generally to investigate the possible uses of counting machines in their mills and correspond with the C. J. Root Company in regard to them.

THE TURBO HUMIDIFIER.

This air moistener is the invention of Albert W. Thompson, master mechanic of the Amoskeag Mfg. Co., who has developed it during recent years under thoroughly

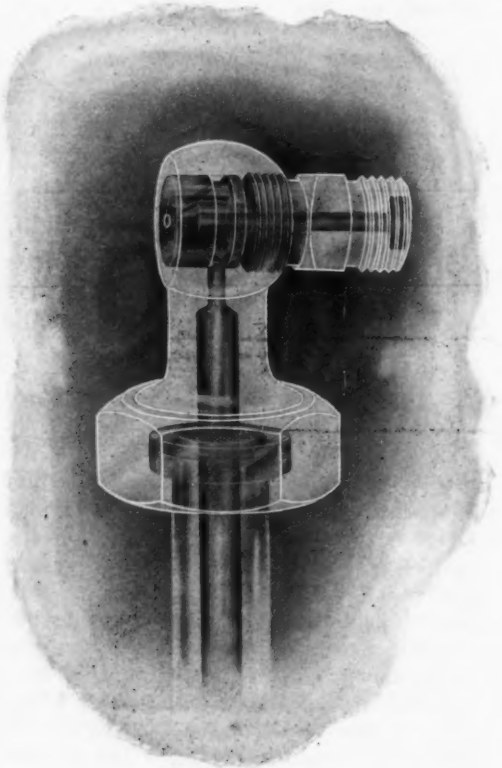


FIG. 2.

practical conditions. The fact that it is in successful operation in the following leading mills places it outside of the experimental stage and among the approved appliances of textile mills:

Amoskeag Mfg. Co., Manchester, N. H.; Cocheco Mfg. Co., Dover, N. H.; Parkhill Mfg. Co., Fitchburg, Mass.; York Mfg. Co.,

Biddeford, Me.; United States Bunting Co., Lowell, Mass.; Pacific Mills, Lawrence, Mass.; Everett Mills, Lawrence, Mass.; Merrimack Mfg. Co., Lowell, Mass.; Edwards Mfg. Co., Augusta, Me.

This humidifier, which is now being put on the market by G. M. Parks Co., Fitchburg, Mass., is simple, efficient and readily adjusted. There is no water used under pressure. The humidifier can be regulated either individually or in groups. The chief claim for this humidifier, however, is com-

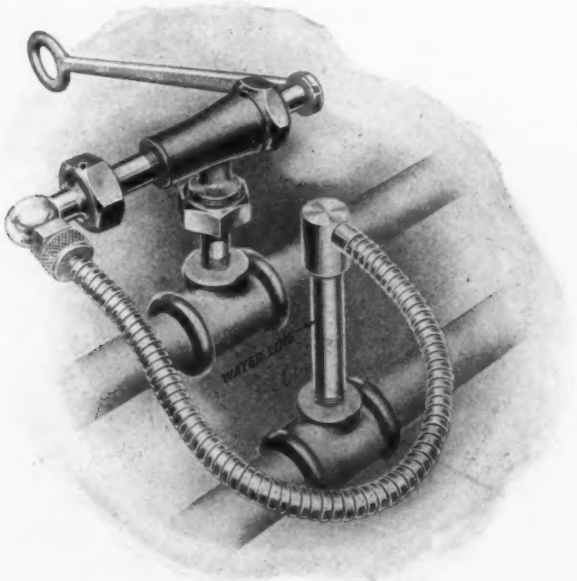


FIG. 3. THE TURBO HUMIDIFIER.

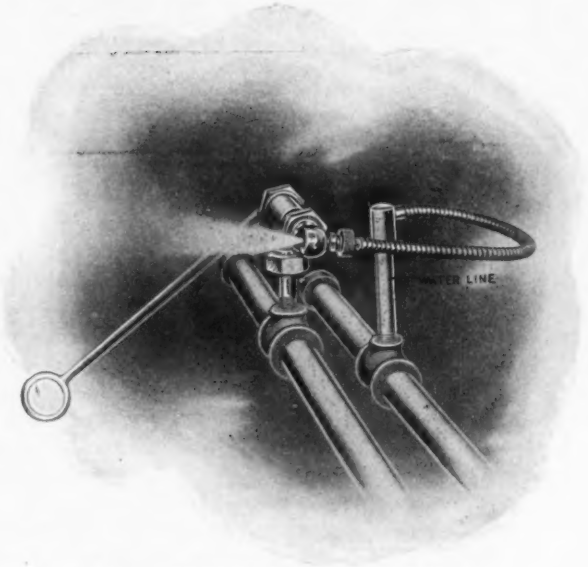


FIG. 4. THE TURBO HUMIDIFIER IN OPERATION.

plete vaporization of the water, by which many difficulties with humidification are obviated.

The principle of the device is simple, being derived from the steam turbine. The following explanation of its operation is given by the manufacturers.

Air of steam is supplied at about sixty-five pounds pressure at the orifice A. This air passes through the tangential orifices in the bushing, BB ; produces a vacuum at the end of the water nozzle E, and by so doing, draws water through the tube I.

The centrifugal motion imparted to the air by the "Turbo" principle, actually pulverizes the water in the chamber C before it is delivered to the atmosphere. Again the importance of this centrifugal action is made evident when the vapor is delivered to the atmosphere, since it spreads the vapor and distributes it before condensation can occur. In other words, it "balloons the jet."

Steam or air at sixty to sixty-five pounds pressure is supplied through a main pipe to the several branch lines in which the heads are located. Parallel with these branch steam or air lines are the water branch lines, which run dead level. Water is supplied through a covered, float-controlled tank. This tank is equipped with either overflow or close up flow pipe, draw off pipe, sponge strainer, etc., and is covered to keep out dust and lint.

One of these tanks will supply from forty to fifty heads, but in large rooms, the best practice is to divide the system into two, three or four separate sections. The tanks can be located in any convenient place. The high and low water lines of the system are determined by the overflow and float valve in the tank. The high water line, controlled by the overflow pipe, is located about two inches below the center line of the head, so that it is absolutely impossible for water to overflow from the heads on floors, machinery, stock, etc.

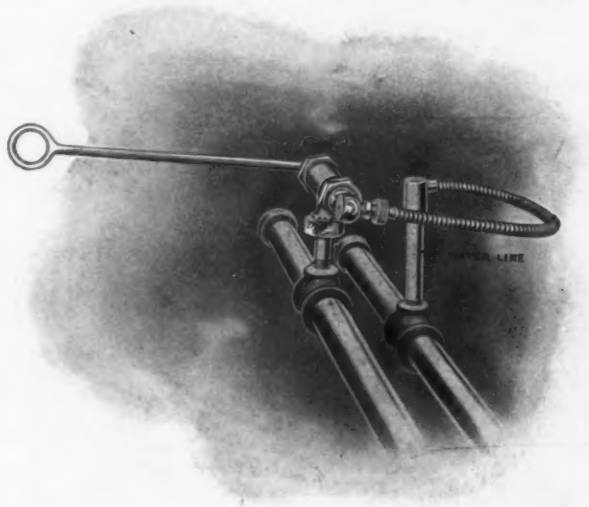


FIG. 5. HUMIDIFIER HEAD SHUT OFF.

The water inlet to the head is connected to the riser nipple in the water branch pipe by means of a non-corrosive, flexible, metallic tube, which, being provided with union connections, makes all parts readily accessible and adjustments easy. The two unions, one vertical and the other horizontal, make it possible to direct the jet in any desired direction. A fine mesh brass gauze strainer for the steam or air pipe is located in the union underneath each head. Any foreign substance that can pass through this strainer can also pass through the steam and air ports. The "Turbo" adjusting valve or cock is located back of each head, so that any head may be shut down without interfering with the others. Simply shutting off the steam or air shuts down the head.

With either the steam or air "Turbo" system, the apparatus may be started independ-

ently of the mill and before the operatives arrive. This makes the system independent of the mill power. Other advantages claimed are, that there being no water under pressure there is no possibility of an overflow and damage stock or machinery; the heads are small and do not obstruct the light, even in low-posted rooms; the spray is so fine that it will not settle on floors, shafting, belts or machinery; the quality, quantity and direction of the spray are within control of the overseer, so that humidification can be adjusted to suit the varying conditions of the work room; there are no castings to collect lint and no drain pipes to clog the overflow; no fans or moving parts to be lubricated or to wear; no cloths or mantles to be cleaned or washed.

The gauze strainer is set in the air pipe supplying each head and any foreign substances that pass through this strainer can also pass through the head, so that the liability of clogging is reduced to a minimum. If the head should happen to clog it is easily taken apart and cleaned by an unskilled workman. No damage can result from clogging, the result being that the head simply becomes inoperative until cleared.

The manufacturers recommend the "Turbo" air system, for the reason that it has all the advantages mentioned above, as well as a heightened cooling effect, and the possibility of running accessory pipes with convenient outlets so that the compressed air may be used for cleaning in and about machinery.

In a room temperature of 80 degrees F. ice melted and re-evaporated is the only medium which shows a greater cooling effect than the "Turbo" air system and, at that, not much. The "Turbo" steam system shows about 75 per cent. of this cooling effect.

It is stated that each "Turbo" humidifier will humidify from 12,000 to 20,000 cubic feet of air according to the varying conditions in the mill. The present is a particularly opportune time for this humidifier to be presented to the trade, owing to the awakened interest in the importance of humidifying air in textile work-rooms. We have in recent issues considered this subject in considerable detail and for that reason need not add anything here in regard to the importance of the objects which the "Turbo" humidifier seeks to attain.

Further information regarding this air moistener can be obtained upon application to the manufacturers.

AN IMPROVED STEAM BLOWING MACHINE FOR LUSTER FINISH.

The only durable luster imparted to face goods during the finishing process is that obtained by winding the cloth tightly on either solid or perforated rolls and subjecting the goods in this form to the action of hot water or steam. Winding the goods on solid rolls with subsequent immersion is a slow and expensive process and subject to many difficulties, the principal of which is the liability of the goods becoming shaded at the sides or ends. This process is now but little used, having been displaced by the more improved method of winding the goods on perforated rolls and then blowing steam through the cloth from the inside of the roll. This method is at present in general use in this country. A modification of this process consists in setting the rolls of cloth in a closed cylinder. Dry steam is then introduced into the chamber and forces its way from the outside, through the goods and perforated roll, the direction being the reverse of that employed with the open machine. The closed process is in extensive use in Europe, particularly in Germany, where it has reached its highest development.

Fig. 1 shows the closed steaming or decatizing machine built by the Paul Klug Machine works, Crimmitschau, Germany, and for which L. H. A. Schwartz & Co., 141 Milk St., Boston, Mass., are the American agents. This machine is used for either a wet or dry process. After the roll of cloth has been placed in the machine and the cylinder tightly closed, the air is exhausted from the chamber by a pump leaving the cloth in a vacuum. Steam is then turned on and allowed to run through the goods for about a quarter of a minute, after which the exit valve is almost closed, allowing but a small amount of steam to come from the cylinder.

The steam pressure is now raised to 1 1/2 atmospheres, under which conditions the goods remain for 5 to 15 minutes, the time varying according to the luster required.

When the pieces have been steamed long enough, the steam supply is shut off and the exit valves opened. As soon as the gauge shows that there is no pressure on the cylinder, the door is opened and the roll of goods withdrawn and placed in the cooling machine, Fig. 2, where the cloth is cooled by having cold air driven through the rolls. One of the claims made for this process is that quick cooling with cold air leaves the goods soft and pliable and increases the luster. The pieces are now ready for the dye house, after which they are finished in the regular manner.

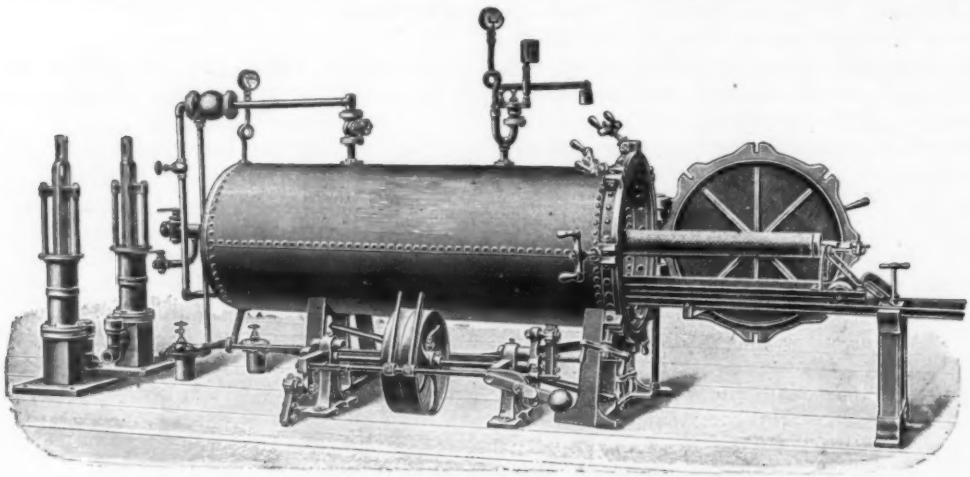


FIG. 1. STEAM BLOWING OR DECATIZING MACHINE.

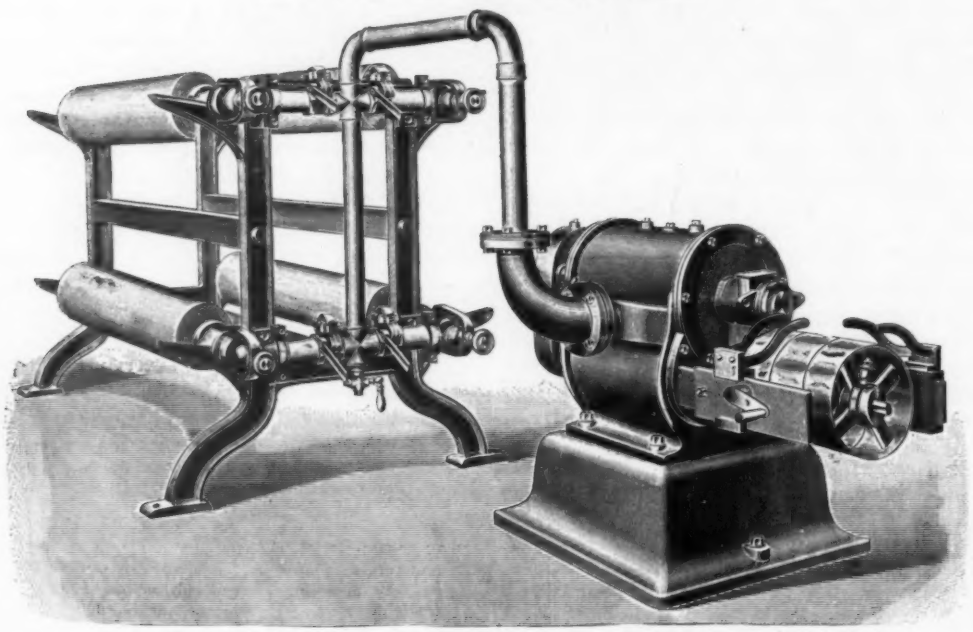


FIG. 2.

Two pieces are sometimes wound face to face in order to avoid having the coarse back weave printed on the face. Another means of obviating this moire effect is to wind a cotton wrapper on the roll with the pieces between the back and the face of the cloth to be steamed. When using this process for dry steaming it is advisable not to wind the cloth very hard on the roll, the object being to avoid having the back threads on the surface of the wrapper print on the face of the goods. The dry process is similar to the wet process of steaming or decatizing already described. Care should be taken not to have the steam pressure so high as to injure the colors. After the goods have been dry steamed they are cooled by the cold air process.

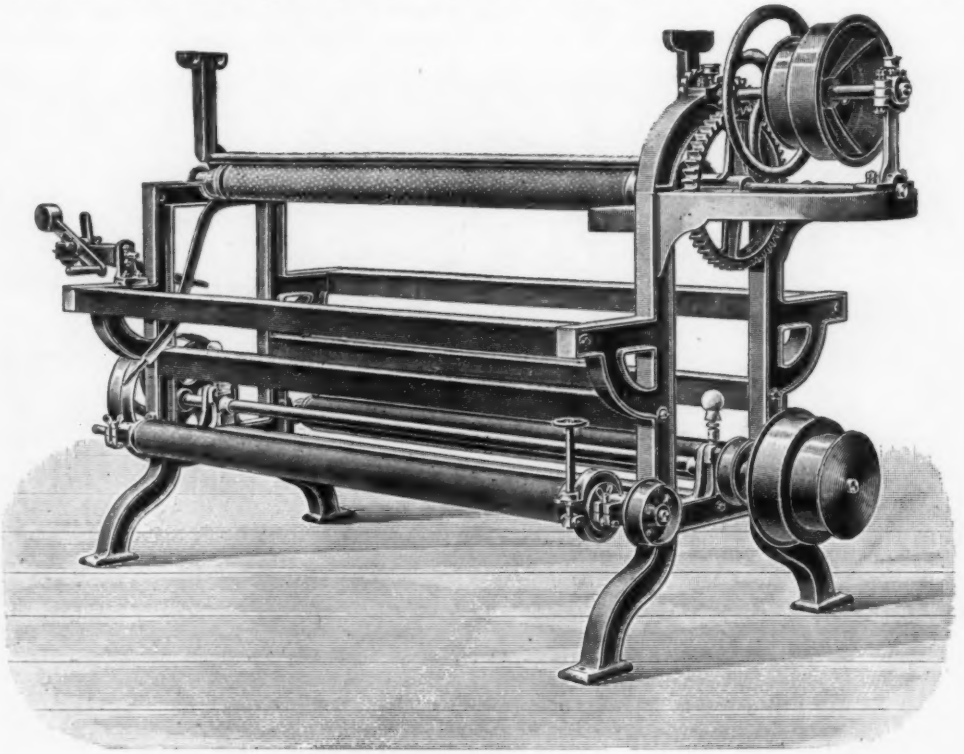


FIG. 3.

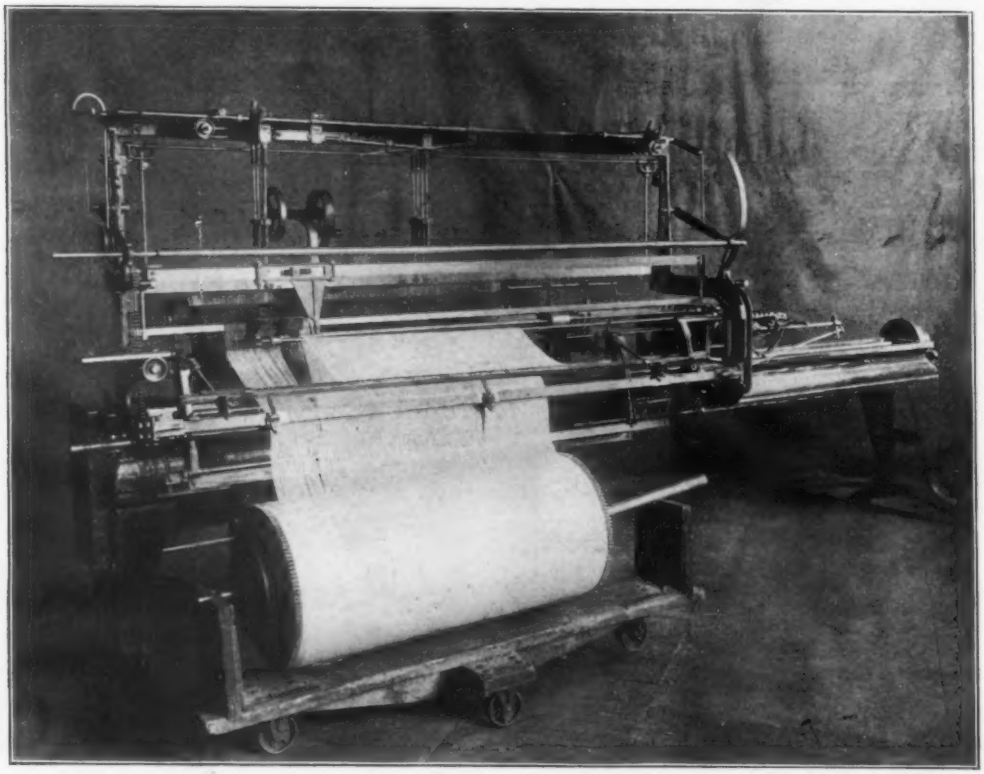
The machine shown at Fig. 3 is used for winding the cloth and wrapper on the roll. It is claimed that with this process of steaming or decatizing a much higher and more uniform luster is obtained, and that the goods take as uniform a color as when dyed without being steamed at all.

Among the advantages claimed for the Paul Klug process of steaming is the prevention of cockles when the goods are sponged preparatory to being made into clothing. This is a serious difficulty which many manufacturers are now having with their goods, and which the so-called London shrunk process does not remedy. The American agents of the Paul Klug machine states that with this closed process of steaming the fabric is set so as to stay in the condition in which it leaves the mill during all the subsequent operations of manufacturing into clothing.

As already stated the closed process of decatizing cloth is in extensive use on the continent and during recent years has been introduced into many English mills. It is in successful use in a large number of American mills, where because of its novelty and the good results obtained it is treated more or less as a secret process. Further information concerning this process can be obtained upon application to the American agents.

THE AMERICAN WARP DRAWING MACHINES.

It is a long time since the drawing-in of warps by machine was a novelty. The large number of drawing-in machines installed throughout this and foreign countries by the American Warp Drawing Machine Co., 289 A St , Boston, Mass., have made the machine process one of the ordinary operations of a textile mill. Since the first successful drawing-in machine was started the mechanism has been steadily developed so as to handle a larger number of harness and more complicated drafts. One of the latest machines to be turned out is in operation at the Richard Borden Mill, Fall River, Mass.



THE AMERICAN WARP DRAWING MACHINE IN OPERATION.

This remarkable machine is similar to the general type which has been manufactured for some years by this company, inasmuch as it draws any kind of pattern up to six harness. It reeds the warp in any way desired, either straight, that is, with the same number of ends in each dent, or to conform to any pattern, skipping dents or inserting at intervals any number of extra threads in the dent. It draws in and reeds the selvage as desired, putting the proper number of threads into the proper harness and any desired number per dent in the reed, and after the selvage is complete it finishes the body of the warp and ends with the selvage on the other side.

In addition to this, their new style of machine known as style H, not only draws through the harness and reed but it draws through either one or two banks of warp stop motion drop bars at the same time.

In addition to drawing a pattern it will drop or skip heddles as desired. This makes it possible for mills to weave cloths of different sets or sleys with the same harness, one manufacturer going so far as to draw a 40s sley warp in a 80s harness, dropping half

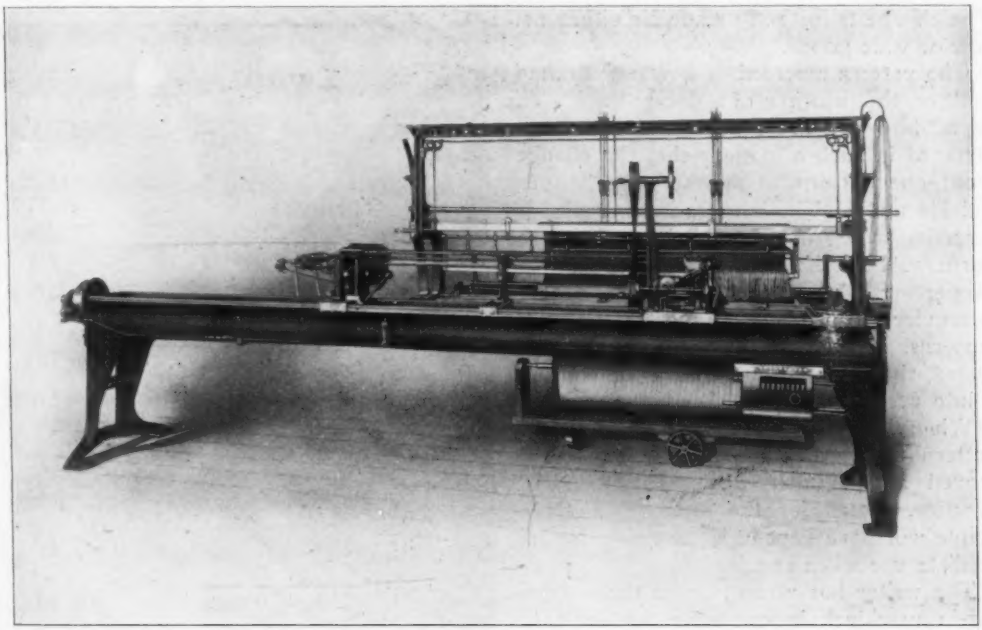
the heddles during the drawing-in process. This extreme practice is not recommended by the builders of the machine, but the case illustrates its capabilities in this respect.

The capacity of a machine is from 50,000 to 80,000 ends per day (according to the nature of the work) on the cotton harness machines, and from 60,000 to 130,000 on the Draper steel harness machine. This brings up the important question of comparative cost, which is shown by the figures obtained in one mill in which five drawing-in machines are now in operation, drawing in an average of 300,000 ends per day at a total cost, including rental of machine, of $14.85. The following is a comparison of cost with the machine and by hand:

By hand, 300,000 ends	$42.00
By machine, 300,000 end	14.85
Gain per day	$27.15

This is equal to a gain of $5.43 per day or over $1600 per year for each machine as compared with cost of hand work.

No mill is too small and none too large to use these drawing-in machines profitably, and the installations run from one machine to seven. Moreover, there are a number of advantages in the terms under which machines are installed. It is not necessary for the manufacturer to purchase machine outright at a high price, assuming all risks of depreciation by reason of wear, breakage and possible improvements in the mechanism. Instead of this the machines are installed in consideration of a small installation payment and an annual rental, which cover transportation charges, inspection and maintenance. Under this system there is no loss from depreciation and the mill is supplied with many improved appliances as they are brought out.



THE AMERICAN WARP DRAWING MACHINE IN OPERATION.

The machines so far developed are built in five different styles. The first, known as style G, covers all work drawn in on 2 cotton harness. Style K handles work of 4 cotton harness or less. Style M has a capacity of 6 cotton harness or less. Style N is a machine with the capacity of 4 or less banks of Draper flat steel harness. Style H, the latest type already mentioned, handles five or less cotton harness and one or two banks of warp stop motion drop bars.

Each of these five machines is made in four different lengths, as follows:

No. 1 for warps up to 45 inches spread
No. 2 for warps up to 58 inches spread
No. 3 for warps up to 90 inches spread
No. 4 for warps up to 116 inches spread

The Nos. 3 and 4 machines are made adjustable so that the working parts can be shortened when drawing in narrow warps, thus making the machine as convenient for this class of work as the narrow machine. The change is instantly made for either narrow or wide goods.

The pattern mechanism for fancy drafts is built on the principle of a dobby head. The parts, however, are much smaller and constructed in such a manner that the changes from one pattern to another can be very quickly made. The harness is controlled by inserting a peg in a bar chain opposite the harness where the draw is required, and the proper arrangement of these pegs is all that is required to produce the most complicated patterns. The pattern once properly adjusted, the machine does the work with absolute accuracy.

When it is desired to change from one pattern to another the chain is easily removed and another one substituted. In practice, chains for the different kinds of staple work are kept in stock ready for immediate use when required.

The writer has recently seen these drawing-in machines in operation and was informed by the manufacturer, overseer and operatives that they are a success in every respect, doing not only far more work at a greatly reduced cost, but doing it better than it is possible by hand. There is also the very important advantage that it does not require years to produce skilled help, but that a few weeks' practice will make an efficient operator, from either man or woman of ordinary intelligence.

Every mill manager will appreciate this feature as being of great importance.

The value of the raw cotton sold by the United States to foreign countries in the year ending June 30, 1907, amounted to $481,277,787.

MOTOR DRIVEN PUMPS.

The advantage and convenience of the modern Crocker-Wheeler circular form of electric motor over the older bi-polar type is perhaps in no case better illustrated than in motor-driven rotary pumps and blowers. The standard types of motors are of approximately the same diameters as pumps of corresponding capacity, which produces sets of neat and compact design. The advantage is not of appearance only, as saving of floor

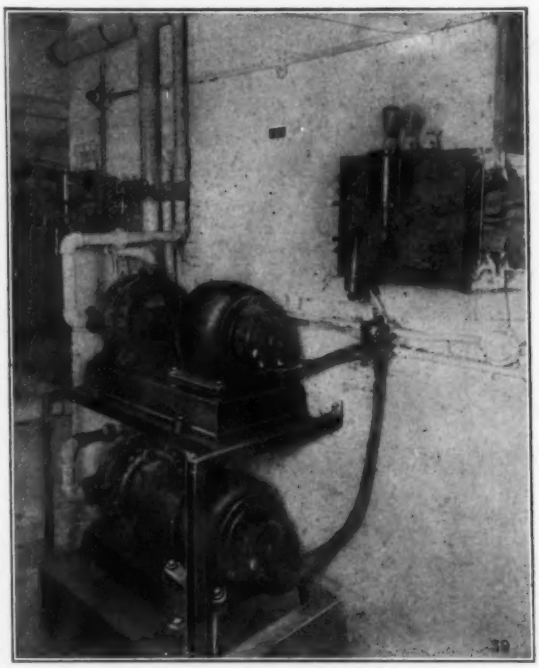


FIG. 1.

space is in most cases an important factor. The pumps shown in Fig. 1, for example, having a combined capacity of 2,400 gallons per hour against a 100-foot head, require floor space of only 2 by 3 feet, and the combined height of the two pumps, as shown in the illustration, is less than five feet.

In addition to its compactness the circular form of motor is easily provided with covers in cases where the presence of dust or moisture makes them advisable.

A motor drive for pumps is in all cases advantageous, owing to the possibility of entirely automatic control. A tank switch,

operated by the rise and fall of the liquid, or a pressure switch in the case of compressors, closes and opens the circuit automatically, operating an automatic self starter which controls the pump motor.

In the case of blowers, speed control is another important consideration. In some

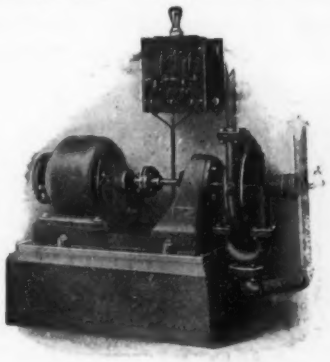


FIG. 2.

cases this is also made automatic by means of a thermostatic device, to regulate temperature by the volume of air blown past a heater. It is due to the ease of control of the electric motor that fans and blowers have come into general use for heating as well as for cooling.

Noiseless running is another point which

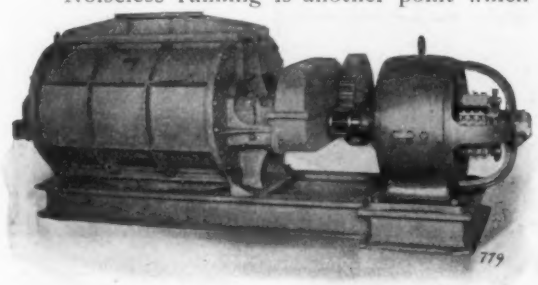


FIG. 3.

may be mentioned in favor of motor drive for pumps. This is particularly important in hotels, shops, restaurants, etc., where the noise of reciprocating parts is a source of annoyance to patrons and tenants, and thereby a cause of loss of patronage to the proprietor.

The accompanying illustrations, supplied by the Crocker-Wheeler Company, Ampere, N. J., show a number of rotary pumps and similar machinery driven by C-W motors, and illustrate the wide capacity of these motors.

Fig. 1 shows two two-stage Tacony turbine pumps with Crocker-Wheeler motors. Fig. 2 is a centrifugal pump with C-W motor. Fig. 3 is a Piqua blower with C-W motor.

THE BERRY SAFETY FEED WATER REGULATOR.

The benefits to be derived from the automatic regulation of the boiler feed water have long been generally conceded, and a great variety of devices have been designed. Many have proved successful, automatically maintaining the water level in the boilers. It

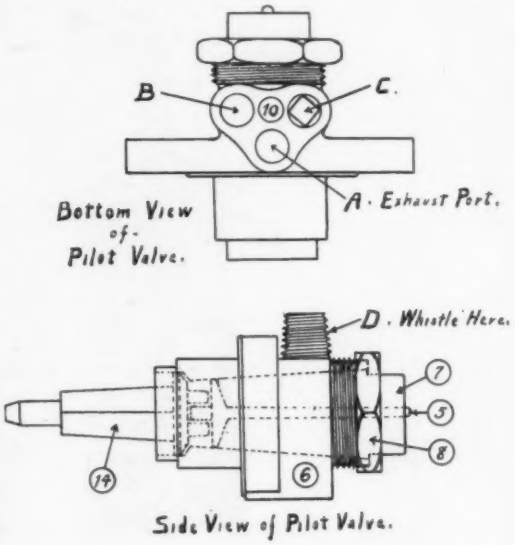


FIG. 1.

is, however, not only necessary to provide an appliance that will be sure to do the work, but it must be strong and durable and reliable at all times; it must give warning when anything unusual happens and must be at all times accessible for inspection or repair. An additional very desirable and almost necessary feature of a feed water regulator is some means of adjusting the level at which it is desired to carry the water while the machine is in service. The Berry Engineering Co., Chester, Pa., are confident that these requirements are met by their safety auto-

matic feed water regulator. This regulating device is combined with the usual water column and high and low water alarm, making necessary only one machine on the boiler. A seamless copper float responds to the variation in the water level of the boiler, and furnishes ample power to rotate the pilot-valve through a simple lever. It is the office of the pilot-valve to direct steam to the feed or control valve through the 1/8-inch pipe; or to the whistle for high and low water alarm.

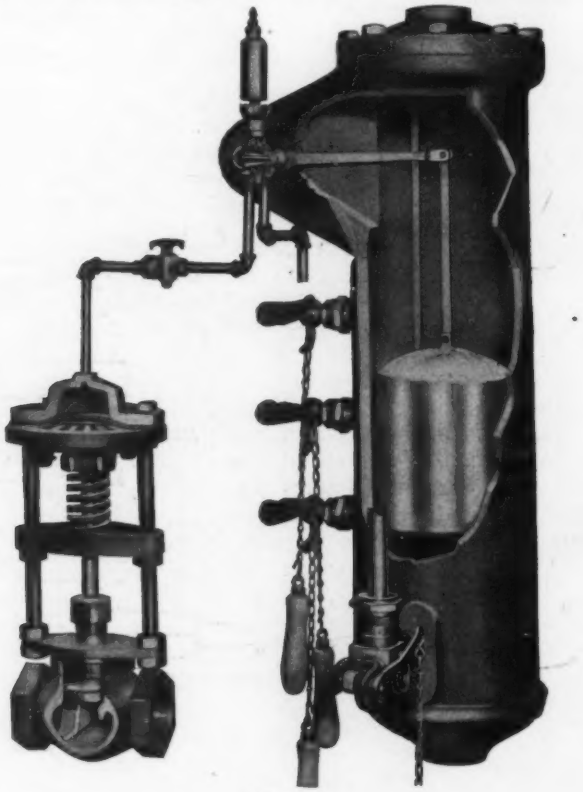


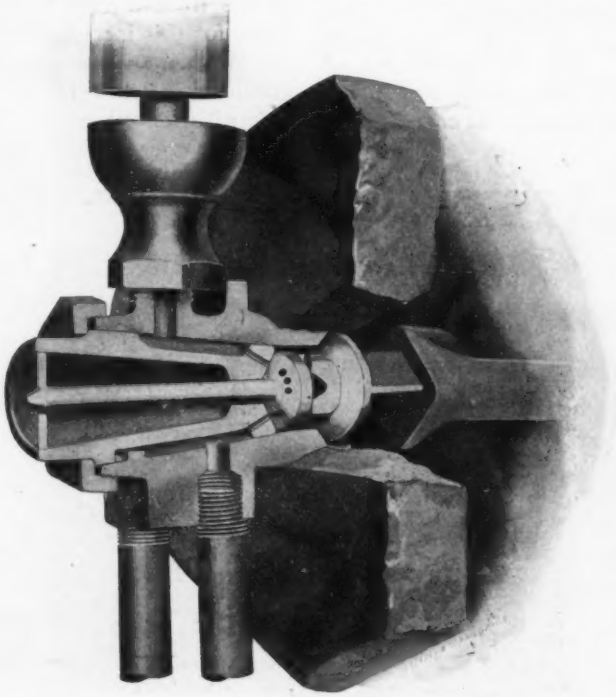
FIG. 2.

The operation is dependent upon gravity alone, and special means are employed to make this positive and sure. First, the column is provided with internal longitudinal ribs which serve to guide the float to insure against sticking, and to prevent the float from interfering with the operation of the gauge and try cocks. Again, there are only three moving parts employed. Finally, the floats are subjected to a special process whereby they become non-collapsible under steam pressure, and are made light and buoyant enough to insure positive operation under all conditions, and at the same time, strong enough to be proof against collapse and leakage.

The feed or control valve is made fully as strong and sensitive as the regulator itself. The valve is always wide open or tight shut, and does not wear from wire drawing; the diaphragm is supported by a flexible ring of steel plates that relieve the rubber of all strain, and make it practically indestructible.

The pilot valve embodies all the mechanism that can require cleaning or regrinding, and is so constructed that the valve and its seat can be removed for inspection and cleaning while steam is on the boiler and while the column remains in service showing the water level in the glass. This can be done with safety. The construction renders it impossible to replace these parts in the wrong position; in other words, it is practically fool proof. The action of this valve may be understood by reference to

Fig. 1 and to the cut, Fig. 2, showing in section the position of the valve when the water is at the level of the center gauge cock. When the nut, 8, is about half way removed, the internal valve, 14, will close and the plug, 7, and valve seat, 5, can then be safely taken out. The internal valve stem, 14, engages the pilot-valve stem, 5, and these parts rotate with the variations in the water level, the plug, 7, remaining stationary.



CROSS SECTION OF PILOT VALVE.

A slight rise in the water above the set level will bring steam to the pressure port, B, and at the same time connect the pressure port, C, with the exhaust port, A. A similar lowering of the water level will bring the pressure to port, C, and connect port, B, with exhaust port, A. In normal operation, the variation never exceeds one-half inch, but if from any cause the water level should not be maintained, the steam would be directed to the whistle port, D, and the alarm will blow for either high or low water.

By turning the pilot-valve plug, 7, slightly to right or left, these operations are advanced or retarded and the water level altered. The action of this valve makes it possible for either a rising or falling water level to bring pressure on the feed valve, and provides for all possible cases of control which may arise.

With the ordinary installation, where a number of boilers are fed from the same pump, a feed valve is placed in the individual feed line to each boiler, and closed by the operation of the regulator when the water rises above the desired level. In single boiler installations, regulation can be obtained with a pump governor in the steam line to the pump. If a belted pump is used, the control valve can be placed in a by-pass from the delivery pipe to the suction, allowing the pump to run all the time; or a belt shifting device can be operated to start and stop the pump. This is often accomplished at a great distance, the action being immediate in all cases, as the pipes are full of water.

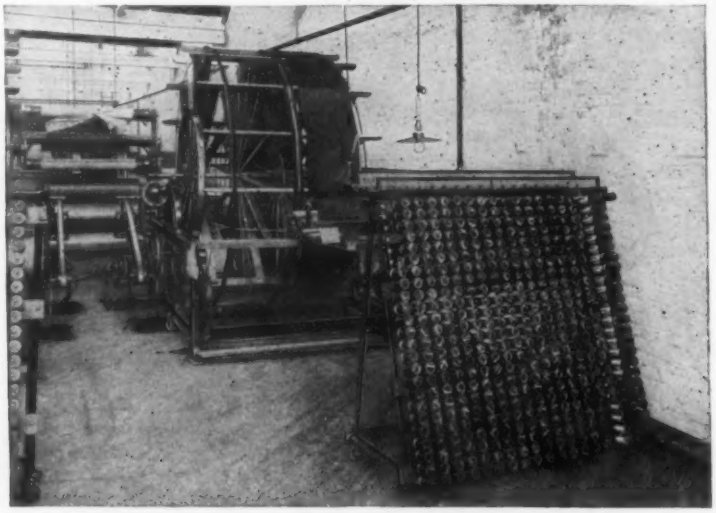
While primarily intended for use with steam boilers they have been installed to regulate the water level in hydraulic pressure reservoirs and are giving satisfaction in this as well as in many other special arrange-

ments. The regulators are made both right and left hand. The try cocks are always under the horn out of the way, and the gauge glass stands conspicuously in front. This is of great value where otherwise the piping and connections would be awkward and difficult; and it also adds to the general appearance of the outfit which is an ornament to any boiler-room. The Berry Engineering Co.'s standard fixtures shown here are of the special style which can be removed for inspection while steam is on and the column in service.

A working model of this apparatus can be seen at the Boston office of the company, 103 Bedford St., Boston, Mass.

tion where an engine of 100 h. p. capacity was delivering power to looms and necessary preparatory machines. All looms and machines were stopped and it was found that 42 h. p. was lost in transmission. This loss, or as it is generally termed, "friction load," is greatly increased when the machines are placed in operation, and it must be borne in mind that the manufacturer receives no returns from the power required to compensate for this increased friction load.

In this system the maintenance items, such as cost of attendance, care and renewals of belts, oil, etc., and the liability of all factory operations being suspended should



SILK WARPER DRIVEN BY GENERAL ELECTRIC ¾ H. P. MOTOR.

THE ELECTRIC MOTOR IN THE SILK INDUSTRY.

BY H. L. H.

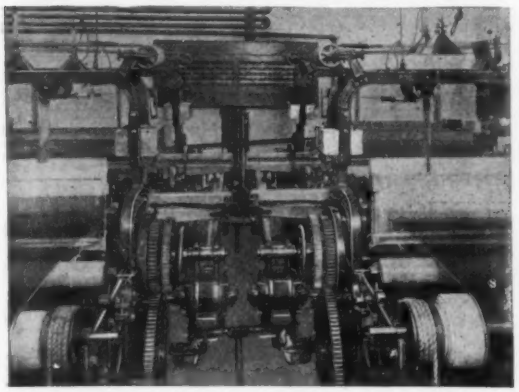
The three methods of driving in common use are: Mechanically—Line shafting, belts or ropes. Electrically—Grouping looms or preparatory machines under one motor. Electrically—Individual motor for each machine, particularly looms.

The old system is the long line shaft drive running full length of the weaving room and counter shafts driven from a main line shaft. An example of the extravagance of this system was recently called to the writer's attenaccidents happen to the shafting, are to be seriously considered.

In the motor driven mill the first question to be considered is whether the current is to be direct or alternating. Under some conditions a variation in speed is required, in which case the direct current motor is indispensable. However, inasmuch as the conditions in a silk mill demand constant speed, it is usually found that the alternating current motor offers marked advantages.

The speed of a direct current motor rises until the normal temperature of the windings is reached. For example: a loom driven by a 40 h. p. direct current motor and

operating at 20 picks per minute, would start off each morning at 111 picks per minute and gradually increase in speed until normal temperature conditions were reached, when the loom would operate at 120 picks per minute for the balance of the day. To compensate for this increase in



GROUP OF GENERAL ELECTRIC ½ MOTORS DRIVING CROMPTON-KNOWLES SILK LOOMS.

speed, the operator must regulate a speed controlling rheostat in the field circuit of the motor.

With alternating current motors none of these difficulties are experienced. The speed of the motor, being dependent on the speed of the engine, does not vary when under constant load. The absence of brushes, commutators and all moving contacts in these motors materially reduces the fire risk. With these characteristics in view, alternating current motors should decidedly be given the preference for silk mills.

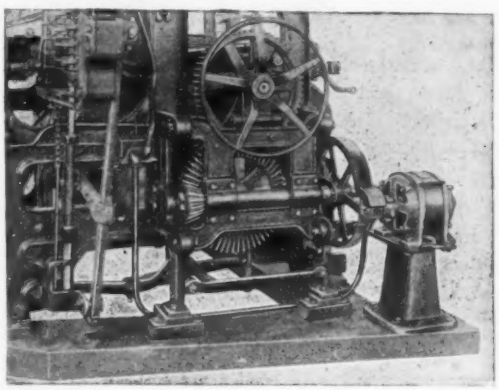
Very good results can be obtained from the "group system" of operation if particular attention is given to the arrangement of the shafting and the selection of proper motors for the work to be performed.

A group of 48-inch looms, say 75 to 100 in number, can be driven by a 40 to 50 h. p. motor. Although the torque required to start a loom is 100 per cent. above normal running torque, this size motor would be ample for operating these machines successfully, since it is not likely that a sufficient number of looms would be started at the same moment as to overload the motor. The group system has the advantage of great flexibility, due to the fact that any group may be run independently of any other, and should a break-down occur that particular group would be the only part of the mill affected.

Within the last few years the individual drive has been steadily gaining in favor with mill owners.

The method of installation as employed by the General Electric Company is very simple. In place of the belt pulleys on mechanically driven looms, and in place of the friction clutch pulley used on such looms and also by some advocates of the individual drive, there is mounted a gear meshing into the motor pinion. The gear is equipped with a device, the duty of which is to protect the loom from excessive shocks when the loom "bangs off." This arrangement gives the same elasticity as is obtained by the slipping of the belt and by the friction disc pulley ordinarily provided. A bracket bolted to the frame of the loom supports the motor.

The most beneficial result of the individual drive is the increased production. This is conservatively figured at 5 per cent. and is entirely due to the constant speed of the loom.



BROAD WORSTED LOOM DRIVEN BY 1 H.P. INDUCTION MOTOR

The accompanying illustrations show one of the recent installations of this system and it will be noted that each machine is driven by its own individual motor. The looms were purchased from the Crompton-Knowles Company the motors from the General Electric Company.

Dyeing, Bleaching, Printing, Etc.

THE DYEING OF HOSIERY YARNS AND HOSIERY.

BY LOUIS J. MATOS, PH. D.

To dye properly any of the various counts of cotton yarns usually employed in the hosiery and knit goods trade depends considerably upon the kind and character of goods to be manufactured and also the ultimate outlet for the finished product.

Naturally the first thought in both yarn and hosiery dyeing is to the proper equipment of the plant, for without some convenience for the work, introduced for the purpose of facilitating its passage from one department to another, the maximum output of properly finished goods cannot reasonably be expected.

Without any regard to the size of a dyeing plant, I have always contended that the old and antiquated methods of the forefathers should be forgotten, and that every progressive idea, both mechanical and chemical be made use of to the fullest extent. Wherever possible, yarn dyeing machines should be installed so that the condition of the yarn may be preserved, and while hand dyeing still occupies a most prominent position, yet the spirit of commercialism is so shaping affairs that wherever a machine is capable of doing the work of men with equal results, it should be introduced.

For black dyeing, the machine has been found admirably adapted for certain processes, but not for all, while for the range of colors it is also of great value. Some dyeing machines which do not require any handling of the yarn or hosiery after once being charged are to be given careful consideration as they have advantages which should not be overlooked. Of course the average hosiery dyehouse is equipped for both yarn and hosiery dyeing, black and colors, and for our present purpose the details will be given for hand and machine dyeing, according to the particular process in use.

Blacks for hosiery are of several kinds, the most extensively employed being the so-called aniline black process, based upon the use of aniline oil. Much has been written about this process, and no doubt much more will be written, both of a technical and highly scientific character, for the purpose of clearing up some of the obscure points of the chemistry of the process, but my experience has been that owners of the dyehouse, and the dyer himself, are not in the least interested in the obscurity of these points, but are greatly interested in the most direct method of producing a better, brighter and cheaper black than their neighbors.

Many processes have been described for aniline black, and no doubt each process in the hands of its originator yields excellent results, but there is no one process for this black which will yield uniformly good results in the hands of any black dyer without considerable experience. I have seen experienced aniline black dyers of intelligence who have signally failed to produce a satisfactory black from a formula which in the hands of another dyer of practically no education and with absolutely no conception of how to work scientifically, produce a black of superior quality.

Aniline black dyeing is strictly a trade by itself and when a dyer has succeeded in carrying out the process in a mill where large quantities of yarn are dyed black, he will have as much on his hands as can be properly taken care of.

The choice of aniline oil, or aniline salt, is a detail; the advantage, however, seems to be in favor of the salt. The one drawback to the aniline black process is the possibility of injuring the cotton, due to the presence of the acids required in the process. If care is exercised in operating, and the various solutions made up in a proper manner, the possibility of injury is remote,

A process which has given very frequent satisfaction is as follows: The yarn in small quantities is thoroughly soaked in the dye

liquor contained in a small tank or tub, then squeezed out thoroughly, and placed in a steamer where it is subjected to a pressure of 3 to 3 1/2 pounds for 20 to 30 minutes. The dye solution is prepared in the following manner, and if properly made up will yield a handsome black:

Solution A.

Aniline oil	lbs. 18
Hydrochloric Acid, 21°	lbs. 27
Sulphuric Acid, 66°	lbs. 36
Water	gals. 72

The acids are first added to the water, and then the aniline, with stirring until dissolved.

Solution B.

Bichromate of Soda	lbs. 36
Water	gals. 72

Bichromate of soda is always cheaper than the corresponding potash salt, and its use is always to be insisted upon whenever possible.

When the above solutions are cool, about a gallon of A and B are taken, mixed in the small tub, and a few hanks of yarn at a time are worked in it as described above. Almost immediately a peculiar bronzy appearance is noticed which disappears during the subsequent steaming. If hydrochloric acid alone is used in solution A, a bluish black would result. If sulphuric acid were alone used, the black would be reddish in tone. The proportions of acids above indicated, 3 hydrochloric to 4 sulphuric produce a pleasing jet black tone which may be modified by the dyer at will.

The development of the black by outside oxidation is the general method applied to knitted hosiery. If carried out carefully and not too rapidly, the results are very good. The principal drawback which is sometimes noticed is that the black formed by the oxidation is superficial, and not in the fiber, the consequence being that it is not fast to washing. Slow oxidation in the cages and weaker dye solutions made up with proportionately smaller quantities of acid answer the purpose.

For 100 pounds of hosiery, the following is used:

Aniline Oil	lbs. 10
Bichromate of Soda	lbs. 15
Muriatic Acid, 21° B.	qts. 17
Water	gals. 200

Oil of vitriol may be added to modify the tone of black, reducing the quantity of muriatic acid in proportion. The vat is filled with water and afterwards the aniline oil and acid are added, followed by the solution of bichromate. In order that the process may proceed slowly and evenly, only one-half of the chemicals are added first, and the remainder in about half an hour. Dyeing proceeds cold. When the color becomes pronounced, the bath is heated to 140° F., when the shade is developed, the time varying with the degree of concentration of the bath. For the above proportions two hours are sufficient. Too short a time during the heating, when the black is developed may be responsible for the black to become greenish, in which case a second oxidation at 170° F. becomes necessary, although it is always more economical to complete the work in one operation if possible.

Final oxidation of the dyed black is an important feature of the finishing of dyed hosiery. After washing the excess of dye liquor from the dyed material, it is put in revolving cages or drums of various forms of construction and kept tumbling about in a heated atmosphere for an hour or so, during which time a more or less complete "oxidation" takes place, besides a certain degree of "finish" is imparted. Many attempts have been made to combine oxidation and finishing so that the goods may have the much desired lisle effect, which is a property rather beyond the scope of any finishing process.

While lisling is possible, it is not permanent, and lasts only as long as the hosiery is in stock and not worn. Immense quantities of finishes have been made and sold to impart such a finish, but none have quite met the fullest expectations.

The effect of "tumbling" at the elevated temperature, besides exposing the socks, etc., to the effect of the heated atmosphere, is to remove by friction the nap or fuzz on the surface, the removal of which leaves them in a remarkably smooth condition.

The application of a finish is usually made after dyeing and washing, and just before boarding, and should be of such composition as not to make the cotton harsh or stiff, nor

impair to the slightest, the brilliancy of the black.

A very good finishing compound is made by dissolving gelatine of good quality in water to make a solution, when cold, of about the same fluidity as ordinary 50 per cent. soluble oil, and which is mixed with an equal volume (quart for quart) of such strength soluble oil. A sufficient quantity of this mixture is used in the final wash water, from which the hosiery is removed without excessive whizzing, and then boarded. The quantity of this size required varies from one pint to one quart for each 100 pounds of cotton goods.

Soluble oil alone is much used, as it imparts softness, a slight lustrous appearance, and materially brightens the black, which is most essential. If the oil is of good quality, it is odorless.

As a universal finish, however, for black hosiery, a good soap, used sparingly, has advantages that strongly commend it, but the possibility of an odor being left in the goods deters many hosiery people from using it.

The use of sulphur colors in hosiery work is continually on the increase, not only for blacks, but also for the tans, all of which are quite easy to dye and do not require the generally extensive plant that dye houses for other colors demand. Sulphur black may be dyed either in an open tub or vat or the most elaborate dyeing machine, provided the liquors do not come in contact with any metallic surface, such as copper, brass, or bronze, which act injuriously on sulphur solutions. As all sulphur color liquors must contain sodium sulphide, besides varying quantities of either soda ash or caustic soda, the advantage of using iron dyeing appliances is at once apparent.

A proper equipment for a hosiery dyehouse, both for yarn and knitted goods, is to employ wooden dye vats of the usual construction for the yarn, and rotary machines for the socks, etc., both so equipped that ample steam may be supplied at all times, for the success of dyeing with the sulphur colors depends upon boiling the cotton in the dye liquor.

Take as an example the use of one of the recent improvements in sulphur blacks, viz, Autogene Black Bee. The proper strength of the solution for yarns should be 10° to 12° Tw. when the solution is at 60° F. The color may be dissolved directly in the dye bath with half its weight of sodium sulphide, together with about ten parts of calcined soda for each seven parts of dye; after all are thoroughly dissolved, add salt—usually 100 to 110 pounds will be necessary, to give the solution its proper strength. The solution is brought to the boil and the yarn then entered and worked for an hour, keeping the temperature about 195° F. This procedure gives very good results. Lift the yarn, squeeze well and save all the excess dye solution in a catch-all, rinse with a good supply of water and finish as required. Proper density of dye bath and maintenance of temperature mill give uniform results, and by regulating the additions to the bath, a splendidly working kettle is secured. The third and successive baths are made by adding four pounds of Autogene Black Bee with two pounds of sulphide to the old bath, and four pounds of soda ash, and about 20 to 24 pounds of common salt to keep up the density.

For hosiery dyeing in the machine, the same proportions hold good, except that the volume of water and quantity of salt are less, while all the other ingredients remain the same for 100 pounds of goods.

Finishing of sulphur colors on hosiery does not differ from any other style of finishing, and the methods of one are applicable to the other.

Plans for a combined sulphur color (black and tan shades) and an aniline black hosiery dye house will be shown and described in a later article.

There are 31 aniline color works in Germany, but the greater part of the trade is in the hands of five firms. The combined capital of these five firms is about $25,000,000.

The foreign trade of the Dominion of Canada for the twelve months ending June, 1906, aggregated $612,652,107, an increase of $65,023,069 over the previous year.

THE BARTLETT WATER SOFTENER.

The impurities ordinarily found in the water supply of mills along with the great importance of pure water in the dyeing and finishing makes the process of purifying and softening water of great importance to textile manufacturers. While the manufacturers suffer from the effects of impure water, very few of them understand the nature of the trouble or the method of remedying it. To supply the desired information the Northern Water Softener Co. of Madison, Wis., have issued in a recent catalogue a concise statement bearing on the foreign materials found in water, their effects in industrial plants and the method of softening and purifying water to overcome the difficulties rising from its use in the natural state.

HARD WATER.

To understand the true value of soft water and the principles of water softening one must know to a certain extent the ingredients which cause water to be hard.

Rain, as it falls to the earth, holds no solids in solution but absorbs carbon dioxide gas and air in passing through the atmosphere. In percolating through the ground it comes in contact with various minerals that are soluble, dissolves them and carries them along in soluton. If it falls in a region where the predominating rock is granite or other practically insoluble substances it does not dissolve much of them, but if the predominating rock is lime-stone the water dissolves a considerable quantity.

The following are the ingredients generally found in water and their effect in steam boilers.

Two of the most common constituents of mineral waters are calcium carbonate and magnesium carbonate, generally spoken of as lime and magnesia. These two ingredients are practically insoluble in pure water, but are soluble in water containing carbon dioxide gas, as this gas unites with them and forms their respective bicarbonates which are soluble.

Calcium bicarbonate is readily decomposed into calcium carbonate when water in which it is dissolved is heated long enough to eliminate the carbon dioxide gas. In this manner calcium carbonate is deposited in the boiler. At ordinary temperatures calcium carbonate is soluble in water to the extent of about 2 1/2 grains per U. S. gallon, but when water is raised to a temperature of approximately 300° F. it is entirely forced from solution. Calcium carbonate is deposited in the form of a loose powder or mud which does not readily form scale by itself, but when deposited in combination with other ingredients, is mechanically held by them in the form of hard scale.

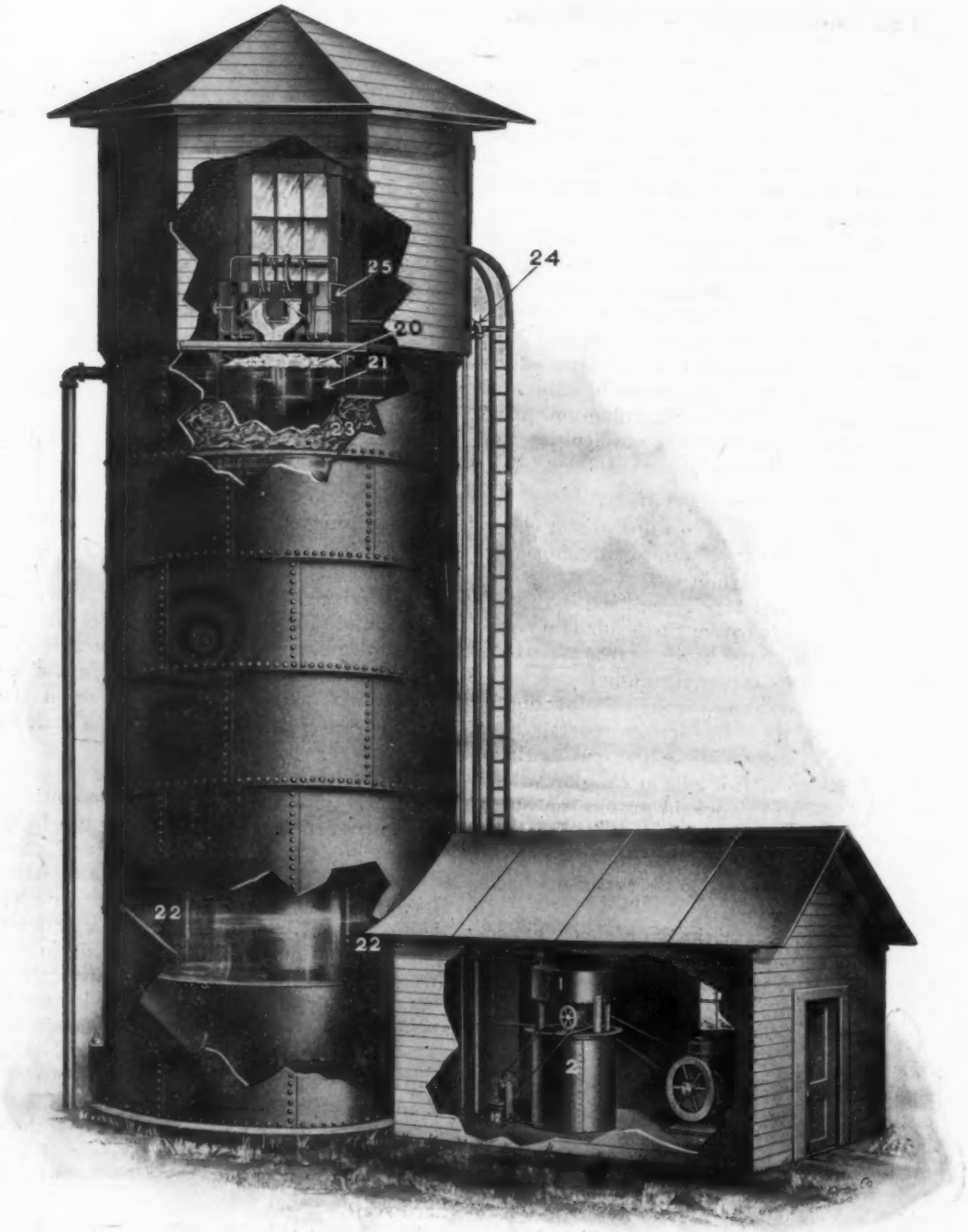
Magnesium bicarbonate reacts in the boiler in the same manner as calcium bicarbonate, but the carbonate, being unstable under high temperatures and pressures, is decomposed into magnesium hydrate or oxide, in which forms it is usually found in boiler scale.

Calcium sulphate (gypsum or plaster of paris) is generally spoken of as sulphate of lime. One part of it is soluble in about 386 parts of water at 70° F. Its solubility decreases as the temperature of the water increases and at about 300° F. (corresponding to 55 lbs. boiler pressure) it becomes practically insoluble and is precipitated in a crystalline form and readily fastens upon the shell and tubes of a boiler forming a scale of great hardness.

Calcium chloride is very soluble in water but is seldom found in any great quantities. It is corrosive in its action under the influence of high boiler temperatures and pressures, but does not form boiler scale itself. However, when the sulphates of other metals are present, reactions take place between it and these sulphates which result in the formation of a hard calcium sulphate scale.

Magnesium sulphate (commonly known as Epsom Salts) is a very common constituent of mineral water, but being extremely soluble, does not form boiler scale. However, when in combination with carbonate of lime, a chemical reaction takes place between them which forms hydrate of magnesia and sulphate of lime, which together form a very hard scale.

Magnesium chloride, although it does not form a scale, is a very objectionable mineral, being corrosive in its action, readily pitting and grooving the boiler.



A BARTLETT WATER SOFTENING PLANT.

Bicarbonates of iron and aluminum react identically to calcium bicarbonate, but after being freed from the carbon dioxide gas, readily decompose into their respective oxides. This reaction is often noticed in many waters which deposit a reddish powder after standing exposed to the air for a short time. These oxides, generally spoken of as iron and alumina, are usually found in water in such small quantities as to have no great bearing upon the formation of scale.

Silica (common sand) is contained in most all waters in very small quantities. It is most frequently found in combination with alumina.

Free sulphuric acid occurs most frequently in mine water and in rivers of coal mining districts. It is a very destructive acid when introduced into boilers as it immediately attacks the iron, forming sulphate of iron, which is readily decomposed to hydrate of iron and free sulphuric acid which again attacks the iron. Such a reaction is spoken of as regenerative.

Free carbon dioxide, found in the majority of natural waters, has a corrosive action upon iron.

Suspended matter (mud) may be either organic or inorganic matter held in suspension and is generally present in variable quantities depending upon the source of supply and the season of the year. Suspended matter enters into the formation of boiler scale only in a mechanical manner, being cemented in the scale by other minerals.

Sodium sulphate (Glauber salt), sodium chloride (common salt) and sodium carbonate (soda ash) do not form boiler scale and are not objectionable unless present in large amounts, when they cause foaming and priming.

THE EFFECT OF HARD WATER ON BOILERS.

The boiler room, being the heart of all industries, is naturally the first place where the effects of hard water will be seen. When a water containing mineral matter in solution is introduced into a steam boiler some or all of these impurities are forced out of solution either through the evaporation and consequent super-saturation of the water or be-

at high boiler temperatures. These minerals, forced out of solution, deposit themselves in a more or less hard adherent crust cause the water loses its power of solution upon the interior of the boiler in the form of boiler scale.

This crust being a non-conductor of heat, tends to insulate the boiler tubes and shell from the surrounding water. This materially reduces the efficiency of the transmission of heat through the metal, which necessitates an increased fuel consumption. Various tables are published upon good authorities, giving the fuel loss due to varying thicknesses of scale; but it is practically impossible to furnish any definite figures for this loss, as the mechanical composition of the scale, the amount of heating surface covered, the type of boiler and the working conditions vary the loss to a considerable extent.

The following table is often given as a conservative estimate where the heating surface is evenly covered.

Scale 1/32 inch thick requires 4% more fuel
Scale 1/16 inch thick requires 4% more fuel
Scale 1/8 inch thick requires 4% more fuel
Scale 1/4 inch thick requires 4% more fuel
Scale 3/8 inch thick requires 4% more fuel
Scale 1/2 inch thick requires 4% more fuel
Scale 3/4 inch thick requires 4% more fuel

Rankine, in his book on mechanics, states that if the resistance to the passage of heat offered by wrought iron is taken as 1, that of carbonate of lime is 17 and that of sulphate of lime is 48.

Besides causing a fuel loss, scale is the cause of the majority of boiler shut downs and repairs. The tubes or plate, insulated from the cooling effect of the water, become overheated and burn. With a hard coating of scale upon a boiler, the temperature of the metal must be raised to about a low red heat to transmit the necessary heat through the scale to keep the boiler under pressure. The iron soon becomes granular and brittle under this temperature and is liable to give away under pressure. The scale, being thicker in some parts than in others, causes an uneven heating of the metal, forming swells, bags or cracks, which necessitate new tubes or a patch on the shell.

EFFECTS OF HARD WATER IN TEXTILE PROCESSES.

The hardening ingredients in water destroy the effect of large quantities of soap by uniting with it and forming an insoluble compound known as "soap curd." Each degree of hardness per gallon of water destroys approximately 1 1/2 pounds of soap per 1,000 gallons of water before any detergent action is produced. In other words, the hard water is softened by the use of soap before any beneficial action is obtained from the soap. To overcome this wasteful result laundry men are forced to add sodas to the water, which precipitate the hardening ingredients upon the goods, making them very harsh. These sodas also rapidly destroy the fiber. The soap curds, deposited in the fiber of the goods being insoluble, cannot be removed by subsequent rinsings. These curds cause white goods to become a dirty gray and are decomposed by the hot iron, causing greasy appearing, yellow stains or streaks, most frequently noticed at the seams. The harshness, due to these curds and the hardening ingredients precipitated by the washing sodas, is especially noticed in woolen and flannel goods. Furthermore, where soap curds are deposited upon goods to be bleached, it is impossible to get a thorough bleaching, as the solution cannot penetrate the portion of the fiber incased by curds. In dyeing, the curds, by filling up the pores, prevent a complete fixture of the dyes, causing spots, streaks and uneven shading. They also act in some cases as a resist, preventing the fixation of the dyes, and with other coloring matter they act as a mordant. Some dyes are also destroyed or their colors changed by a combination with the lime and magnesia of the hard water.

WATER SOFTENING.

"Softening" water is the removal of the minerals from the water which cause "hardness." These ingredients are removed by adding chemicals to water which react with the hardening substances and change them into insoluble compounds, in which form they may be separated from the water. The chemicals generally used to precipitate the scale forming ingredients are quick lime, soda ash, caustic soda and tri-sodium phosphate.

The following table shows the comparative cost of the above chemicals to precipitate the same amount of hardening ingredients:

1 lb. carbonate of lime requires for its precipitation:	
0.56 lbs. quick lime at 1/4c. per lb. . . .	0.14c.
0.80 lbs. caustic soda at 2c. per lb. . .	1.60c.
2.53 lbs. tri-sodium phosphate at 4c. per lb.	10.12c.
1 lb. sulphate of lime requires for its precipitation:	
0.78 lbs. soda ash at 1c. per lb.	0.86c.
1.86 lbs. tri-sodium phosphate at 4c. per lb.	7.44c.

The above table clearly shows that lime and soda ash are the cheapest reagents which can be used.

The cost of treating the average water varies from one to two cents per 1,000 gallons, depending entirely upon the kind and amount of various scale-forming ingredients present.

The water softening apparatus built by the Northern Water Softener Company is of the continuous type and automatic in operation. It consists of three parts:

1. The chemical reagent tanks in which the chemical solutions are made up.

2. The chemical and water proportioning device which proportions the correct amount of chemicals to the water.

3. The reaction and settling chamber in which the chemicals and water are thoroughly mixed and the resulting precipitate removed from the water by sedimentation and filtration.

The chemicals ordinarily used are lime and soda ash. The operation of the system is as follows:

Lime is slaked in tank, 1, and is then run into the agitating tank, 2, where it is made up with water to a definite strength. The lime, being in suspension, must be kept thoroughly and constantly agitated to insure a uniform strength. This is accomplished by means of twisted paddles which rotate within the agitating tank and continually stir the solution.

Besides being automatic the Bartlett Water Softener is capable of being adjusted to suit the varying conditions which may be encountered. The Northern Water Softener Co. make it a point to adapt every installation to the prevailing local conditions. They ask interested parties to send them a sample of the water to be treated which they will analyze without charge in order to study the proposition intelligently and advise regarding the plant that should be installed.

DYE RECIPES.

The following recipes appear in the Dyers' Supplement, which is issued each month by the TEXTILE WORLD RECORD. The Supplement contains the colored samples, dyed according to recipes given. The selection of samples is carefully made, and it is the aim to show shades which are of especial interest to the dyer, and which the requirements of the market demand. The Dyers' Supplement is a 16-page pamphlet, in convenient form for preservation. Subscription price for the Dyers' Supplement $1.00 per year.

Recipe No. 65.

Green on Cotton Yarn.

Immedial Green GG Extra on 100 lbs. cotton yarn. Prepare the dye bath with

10 lbs. Immedial Green GG Extra.
(Cassella Color Co., 182 Front St., New York.)
10 lbs. Sodium Sulphide.
10 lbs. Common Salt.
10 lbs. Soda Ash.

Dye at a temperature just below a boil for one hour, keeping the material below the surface of the liquor as much as possible.

If a standing bath is used, these amounts can be greatly reduced in the second and succeeding baths.

Immedial Green GG Extra possesses good fastness and the characteristic properties of the sulphur colors.

Recipe No. 66.

Lavender on Worsted Yarn.

Acid Alizarine Grey B on 100 lbs. worsted yarn. Prepare the dye bath with

2 ozs. Acid Alizarine Grey B.
(Kalle & Co., 530 Canal St., New York.)
2½ lbs. Acetic Acid.
3 lbs. Glauber's Salt.

Enter at 160° F., bring to a boil, and dye at a boil for 40 minutes.

Acid Alizarine Grey B when dyed directly gives an excellent shade of lavender which when after-treated with Potassium Bichromate becomes a very fast grey. See next sample.

Recipe No. 67.

Blue on Worsted Yarn.

Acid Cyanine B on 100 lbs. worsted yarn. Prepare the dye bath with

4 lbs. Acid Cyanine B.
(Berlin Aniline Works, 213 Water St., New York.)
4 lbs. Sulphuric Acid.
20 lbs. Glauber's Salt, Crystals.

Enter at 150° F., bring slowly to a boil, and dye at a boil for one hour.

Acid Cyanine B possesses good leveling and penetrating power Its fastness to alkalies is excellent, and its fastness to light, weather, acids, carbonizing and washing is good.

Recipe No. 68.

Green on Cotton Yarn.

Argole Green B Paste on 100 lbs. cotton yarn.

First prepare a hydrosulphite solution, 27° Tw., by slowly adding 2 3/4 lbs. zinc powder to 2 1/2 gallons of bisulphite of soda, 72° to 78° Tw. While adding the zinc powder to the bisulphite the temperature of the solution should not rise above 100° F., and it is therefore advisable to cool down with ice. After adding the zinc powder, stir well for one-half hour, then allow to stand for one hour, and filter the solution through a piece of calico. To this solution add milk of lime, which is prepared by slaking 4 ounces of quick lime in 1 pint of water, and then stir well. After allowing to stand for two hours filter this solution and then add 1/2 ounce soda lye, 76° Tw., per 1/4 gallon of liquor. The hydrosulphite solution thus obtained is then made up with water to 27° Tw.

To the dyebath, which contains the proper amount of water at 120° F., add

Three ounces soda lye, 52° Tw., for every gallon of liquor, and then according to the depth of shade required 3 to 8 ounces of the solution of hydrosulphite. 27° Tw., as already made up, for every gallon of liquor in the dyebath.

Stir the dyestuff, Argole Green B Paste (Farbenfabriken of Elberfeld Co., 66 Lafayette St., New York), to the extent of 1 ounce per gallon of liquor with 10 times its weight of water, and add this to the dye bath.

As soon as the dyestuff is thoroughly stirred in, enter the well wet out material. Work for 10 minutes. Warm the bath slowly during 1/4 hour to 140° F., and dye at this temperature for 1/2 to 3/4 of an hour, keeping the material continually immersed in the liquor.

Argole Green B Paste possesses excellent fastness to light, acids, alkalies, washing, boiling, cross dyeing and ironing.

Recipe No. 69.

Brown on Cotton and Woolen Union Material.

Union Brown 9670 on 100 lbs. cotton and woolen union cloth. Prepare the dye bath with

3 lbs. Union Brown 9,670.
(W. F. Sykes & Co., 85 Water St., New York.)
25 lbs. Common Salt.

Enter material at 140° F., raise to 170° F. Keep at 70° F. for from 20 minutes to 1/2 hour, or until the cotton is dyed to the proper shade. Then raise temperature to a boil and dye at a boil for 15 minutes. Allow the material to remain in the dyebath until it has cooled to a temperature of 160° F.

Union Brown 9,670 will be found to be well adapted for the dyeing of union material.

Recipe No. 70.

Blue on Cotton Yarn.

Diamine Bengal Blue R on 100 lbs. cotton yarn. Prepare the dye bath with

3 lbs. Diamine Bengal Blue R.
(Cassella Color Co., 182 Front St., New York.)
1 lb. Soda Ash.
20 lbs. Glauber's Salt.

Enter at 180° F., and dye at a boil for one hour.

Diamine Bengal Blue R possesses the property of exhausting excellently as compared with most of the direct cotton colors. It is, therefore, well suited for producing dark shades on loose cotton, yarn and piece goods.

Its fastness is fully as good as the average direct cotton color.

Recipe No. 71.

Brown on Cotton Yarn.

Oxamine Brown G R on 100 lbs. cotton yarn. Prepare the dye bath with

3 lbs. Oxamine Brown G R.
(Badische Co., 128 Duane St., New York.)
20 lbs. Glauber's Salt.

Enter at 180° F., and dye at a boil for one hour.

Oxamine Brown G R possesses good level dyeing qualities, and good fastness to light and alkalies.

Recipe No. 72.

Blue on Cotton Yarn.

Para Blue G on 100 lbs. cotton yarn. Prepare the dye bath with

4 lbs. Para Blue G.
(Farbenfabriken Co., 66 Lafayette St., New York.)
20 lbs. Glauber's Salt.
2 lbs. Soda Ash.

Enter material at 180° F., and dye at a boil for one hour.

Then couple with diazotized Para Nitraniline, in bath made up as follows:

2 lbs. Para Nitraniline,
1½ lbs. Sodium Nitrite,
6 lbs. Hydrochloric Acid, 34° Tw.,

and sufficient Sodium Acetate to neutralize any excess of mineral acid.

Work in this bath at ordinary temperature for 20 minutes and then wash and dry.

Para Blue G may be easily discharged with hydrosulphite discharging agents and tin crystals, and will be found of value in calico printing.

Recipe No. 73.

Blue on Worsted Yarn.

Acid Cyanine G on 100 lbs. worsted yarn. Prepare the dye bath with

4 lbs. Acid Cyanine G.
(Berlin Aniline Works, 213 Water St., New York.)
4 lbs. Sulphuric Acid.
20 lbs. Glauber's Salt.

Enter at 150° F., bring slowly to a boil, and dye at a boil for one hour.

Acid Cyanine G possesses good leveling and penetrating power. Its fastness to alkalies is excellent and its fastness to light, weather, acids, carbonizing and washing is good.

Recipe No. 74.

Red on Cotton Yarn.

Tetrazo Corinth B on 100 lbs. cotton yarn. Prepare the dye bath with

3 lbs. Tetrazo Corinth B.
(American Dyewood Co., 154 William St., New York.)
25 lbs. Common Salt.

Enter at 180° F., and dye at a boil for one hour.

Tetrazo Corinth B gives Bordeaux shades of great brilliancy and heavy body, which are moderately fast to light and washing.

It is of interest in union dyeing, as the cotton is colored rather darker than the wool.

Recipe No. 75.

Green on Cotton Yarn.

Thiogene Green G on 100 lbs. cotton yarn. Prepare the dye bath with

10 lbs. Thiogene Green G.
(H. A. Metz & Co., 122 Hudson St., New York.)
20 lbs. Sodium Sulphide.
5 lbs. Soda Ash.
35 lbs. Common Salt.

The dyestuff is dissolved as usual in the sodium sulphide. and the bath brought to a boil. The ma-

terial is dyed at a temperature slightly below the boil for one hour.

Thiogene Green G possesses the characteristic fastness of the sulphur colors.

Recipe No. 76.

Black on Cotton Yarn.

Immedial Brilliant Black 5 B V Conc. on 100 lbs. cotton yarn. Prepare the dye bath with

10 lbs. Immedial Brilliant Black 5 B V Conc. (Cassella Color Co., 182 Front St., New York.)
10 lbs. Sodium Sulphide.
10 lbs. Common Salt.
10 lbs. Soda Ash.

Dye at a temperature just below the boil for one hour, keeping the material below the surface of the liquor as much as possible.

If a standing bath is used, these amounts can be greatly reduced in the second and succeeding baths.

Immedial Brilliant Black 5 B V Conc. possesses good fastness and the characteristic properties of the sulphur colors.

Recipe No. 77.

Blue on Cotton Yarn.

Pyrol Blue R R Conc. on 100 lbs. cotton yarn. Prepare the dye bath with

10 lbs. Pyrol Blue R R Conc. (C. Bischoff & Co., 451 Washington St., New York.)
20 lbs. Sodium Sulphide.
5 lbs. Soda Ash.
50 lbs. Common Salt.

Enter at 180° F., and dye for one hour at, or just below, a boil.

Pyrol Blue R R Conc. possesses the characteristic fastness of the sulphur colors.

Recipe No. 78.

Blue on Worsted Yarn.

Acid Cyanine G D on 100 lbs. worsted yarn. Prepare the dye bath with

4 lbs. Acid Cyanine G D. (Berlin Aniline Works, 213 Water St., New York.)
4 lbs. Sulphuric Acid.
20 lbs. Glauber's Salt.

Enter at 150° F., bring slowly to a boil, and dye at a boil for one hour.

Acid Cyanine G D possesses good leveling and penetrating power. Its fastness to alkalies is excellent and its fastness to light, weather, acids, carbonizing and washing is good.

Recipe No. 79.

Red on Cotton Yarn.

Tetrazo Red C R on 100 lbs. cotton yarn. Prepare the dye bath with

3 lbs. Tetrazo Red C R. (American Dyewood Co., 154 William St., New York.)
2 lbs. Soda Crystals.
25 lbs. Common Salt.

Enter at 180° F., and dye at a boil for one hour.

Tetrazo Red C R is of good coloring power and ordinary fastness.

In union dyeing it will be found to color wool stronger and brighter than cotton.

It is especially interesting for the dyeing of artificial silk.

Recipe No. 80.

Blue on Worsted Yarn.

Acid Navy Blue B on 100 lbs. worsted yarn. Prepare the dye bath with

4 lbs. Acid Navy Blue B. (W. F. Sykes & Co., 85 Water St., New York.)
10 lbs. Glauber's Salt.
4 lbs. Sulphuric Acid.

Acid Navy Blue B is adapted to nearly all classes of woolen dyeing. It is very soluble, dyes level, and is reasonably fast to light and fulling. It can be used in combination with other acid dyeing colors.

Color Cards.

Anthracene Chromate Colors; Cassella Color Co., New York.

A folder containing 64 samples of worsted yarn showing shades obtained by the use of Anthracene Chromate colors. Full working directions are given.

Thioxinschwarz Go. 4B, 3Bo and R No; Geisenheimer & Co., New York.

Twelve samples of loose cotton, cotton yarn and worsted yarn showing results obtained by dyeing with different percentages of Thioxinschwarz Go, 4B, 3Bo and R No.

Thioxin-Indigo B; Geisenheimer & Co., New York.

A folder containing samples of cotton yarn, loose cotton and worsted yarn, showing shades obtained by the use of Thioxin-Indigo B.

Thioxine-Black; Geisenheimer & Co., New York.

Eight samples of mercerized cotton cloth dyed with Thioxine-Black. Full working directions are given.

Diamine Fast Grey BN; Cassella Color Co., New York.

Nine samples of loose cotton, worsted yarn and satin, showing results obtained by the use of Diamine Fast Grey BN. This is exceedingly well suited for the production of grey and mode shades.

Mill News.

Those interested in receiving early and more complete investigated information of projected new mills, enlargements, improvements, fires facts and gossip of the trade are referred to the Textile Advance News, issued weekly by the publishers of the Textile World Record, at $15.00 per year.

COTTON.

New Mills.

Alabama, Gaylesville. A cotton mill company has been organized and will build and operate a 5,000-spindle plant. It is reported that the company is capitalized at $100,000 and that a large portion of the stock has already been taken and money paid into the hands of the treasurer. The officers are J. Robert Henderson, president, A. B. Russell, vice-president and treasurer and Mr. Chestnut, secretary. The above named men would like information on buildings and machinery.

*Canada, Quebec, Montreal. The new buildings for the Mount Royal Spinning Co., Ltd., are now completed and it is stated that operations will begin about the end of May. Details of this company were given in January.

*Georgia, Albany. John A. Betjeman, chairman of the Cotton Mill Committee of the Albany Business League, advises that they are making satisfactory progress in the raising of subscriptions and will contract for machinery within the next 90 days. Complete information regarding the proposed mill has been given previously.

*Georgia, Douglasville. Machinery is being installed in the new Lois Cotton Mills.

*Georgia, Junction City. The organization of the company which will build and operate a cotton mill at this place is making progress. E. M. Clements of Charlotte, N. C., is in charge of plans.

*North Carolina, Brevard. Construction work on the buildings for the new Transylvania Cotton Mills has been completed and work has begun on the installation of machinery. This company was incorporated in July, 1907, with a capital stock of $100,000. 5,000 spindles will comprise the equipment. J. W. McMinn is pres.; J. A. Gallaway, vice-pres., and C. M. Cooke, sec. and treas.

North Carolina, Charlotte. There is now in process of organization a new cotton mill which will spin high grades of combed yarns in fine counts from 60s to 100s. The plant will be located in the vicinity of Charlotte. W. W. Hapgood, H. C. Henderson, W. A. Watson and Thomas J. Lillard are among those interested. It is stated that the authorized capital stock will be $250,000, of which $100,000 or $125,000 will be paid in.

North Carolina, Horseshoe. J. G. Hood, of Charlotte, N. C., and associates, will organize the French Broad Manufacturing Co. for the purpose of building a mill here. High grade cotton yarns will be manufactured. It is reported that 10,000 spindles will be installed.

*North Carolina, Kinston. The Caswell Cotton Mills, Inc., has started construction work on its plant. The main building will be 2 stories high, 80 by 200 ft., with 40 by 40 ft. engine room and 40 by 50 ft. boiler room. Complete details of this plant have been given previously.

*North Carolina, Marion. The James Mfg. Co., incorporated in January with capital stock of $100,000, has not completed plans for its proposed mill. J. L. and W. J. McKay of King's Mountain and E. L. McKeon of Guthrie, Oklahoma, were mentioned as incorporators at the time the charter was given.

*North Carolina, Wendel. The proposed new cotton mill will be owned by R. B. Whitley. A building is now being erected and when completed will be equipped with 2,500 ring spindles for the manufacture of 14s hosiery yarns.

*Rhode Island, Riverpoint. The setting up of the machinery in the new plant of the Warwick Lace Works is progressing and some of the machinery has been run experimentally. It is not stated just when manufacturing will begin, but production will possibly start within a few weeks.

*South Carolina, Blacksburg. Latest advices regarding the new Blacksburg Mills intimate that the company is preparing to begin the construction of its proposed plant. As previously reported, J. E. Sirrine of Greenville, S. C., is the architect-engineer in charge and has prepared plans for a 150 by 250 ft. building. The equipment will consist of 5,000 spindles and 128 40-inch looms. The Blacksburg Mills were incorporated in November with authorized capital stock of $250,000. G. Lang Anderson of Williamston, S. C., is president.

*South Carolina, Darlington. More than half of the total amount required for the new cotton mill has been subscribed by local business men. It has been given out that 10,000 spindles and 300 looms will be operated on print cloths. J. E. Sirrine of Greenville, S. C., will be engaged as architect and engineer in charge of plans and construction work. D. T. McKeithan, L. E. Carrington and Bright Williamson are in charge of the project.

*South Carolina, Rock Hill. The new building for the Harriss Mfg. Co. has been completed and machinery is being rapidly installed. The collar pad department has been in operation for a number of months and has been moved to the second story of the building. The Harriss Mfg. Co. was incorporated in July for the manufacture of cotton yarns, collar pads and novelties. The capital stock is $50,000. The new building is 75 by 140 ft. and 2 stories high. W. H. Harriss is pres. and W. S. Adams is treas., agent and buyer. Coarse cotton yarns will be manufactured in the yarn department.

*South Carolina. St. Matthews. The organization of the proposed $400,000 cotton mill company has not been completed. The promoters are still working toward that end, however, and it is prob-

able that the organization will be completed within two or three weeks. This company proposes to develop the power of High Hill Creek and to build a 20,000 spindle cotton mill.

*South Carolina, Simpsonville. The Simpsonville Cotton Mills has awarded contract for machinery. G. H. Cutting & Co., of Worcester, Mass., who have the contract for the erection of buildings, are preparing to start work. The picker room machinery will be furnished by Kitson Machine Shop, Lowell, Mass.; the carding and spinning machinery by the Mason Machine Works, Taunton, Mass., and the Woonsocket Machine & Press Co., of Woonsocket, R. I., and looms by Draper Company of Hopedale, Mass. Full details of this company have been given previously. It is expected that manufacturing will start about September 1.

*Texas, Colorado. B. N. Garrett of the West Colorado Land Co. advises that the new cotton mill company in which his organization is interested will award the contract for buildings and machinery at an early date. It has been decided to incorporate a company with a capital stock of $150,000, and to have machinery equipment of 5,000 spindles and 150 looms for the manufacture of sheetings. Machinery contracts have not yet been awarded.

*Virginia, Bedford City. At a meeting of subscribers to the stock of the proposed Bedford Cotton Mills, a partial organization was effected. James P. Gray, J. D. Ballard, L. R. Gills, J. J. Scott, J. Gordon Smith, J. A. Clark and W. A. Falconer were appointed a committee to further the promotion of the company.

Enlargements and Improvements.

Connecticut, Ansonia. A number of new looms are being installed in the Ansonia O. & C. Company's plant.

Connecticut, Danielson. The Danielson Cotton Co. has bought a strip of land 300 ft. long bordering on the Quinebaug River in the town of Pomfret from F. S. Bruce of Putnam. It is understood that a dam and large reservoir will be built.

Connecticut, Wauregan. In addition to other improvements, the Wauregan Company will install a dynamo for lighting purposes. Contract has been placed. New machinery has recently been installed in the finishing department and in the spinning room. The Wauregan Company returned to full time schedule early in March after a short curtailment.

*Georgia, Athens. The addition to the plant of the Southern Mfg. Co., on which construction work started in August, 1907, has been completed, machinery installed, and manufacturing started. The new building is 350 by 100 ft., 3 stories high and when operated in full will turn out the product of 1,300 mules, 6,100 ring and 3,800 twister spindles and 200 looms.

*Georgia, Columbus. The Eagle & Phoenix Mills, previously reported to be making improvements to their steam power plant, advise that the mills are operated exclusively by water power, partly electrically developed and partly direct. The steam plant is being used for heating the building and for dye house purposes. The improvement will consist mainly in the erection of a new smoke stack, the present stack being overloaded by boilers added from time to time. The stack will be built of Columbus, Ga., brick, by day work. The mill is simply hiring an expert architect and contractor to superintend the job.

*Massachusetts, Holyoke. It is reported that the Lyman Mills may not build the proposed new mill this season. The company will, however, add one story to No. 3 mill. Contract for construction work on this addition has been awarded to Caspar Ranger, and he will begin work at once.

*North Carolina, Cliffside. It has not been decided when the machinery equipment will be installed in the new building erected for the Cliffside Mill. There is space for 25,000 additional spindles.

*North Carolina, Cumberland. A new mill for J. Frederick Houston & Co. is nearly completed. The new structure is 1 story high, 75 by 340 feet, and of concrete construction. The approximate cost is $30,000. The machinery equipment will consist of 5,000 spindles and preparatory machinery for manufacturing cotton yarns.

*North Carolina, Dallas. The capital stock of the Monarch Cotton Mills has been increased from $75,000 to $90,000. This is a new mill which started manufacturing during 1907. 4,100 spindles are operated on cotton yarns.

*North Carolina, Spray. The reported increase in the machinery equipment of the Rhode Island Company consists of 48 broad looms for weaving cotton blankets. The total equipment now is 10,000 spindles and 150 looms. L. McRae is buyer.

Pennsylvania, Philadelphia. Royle & Pilkinton, Leiper and Adams Sts., Frankford, have removed their plant to Mt. Holly, N. J., where it is reported they have consolidated their Philadelphia plant with the branch mill which they have been running in Mt. Holly for the past year. They are manufacturers of upholstery goods on 17 looms and sold their production direct.

Pennsylvania, Philadelphia. The Belmont Mills, Jarrett and Huntingdon Road, Fox Chase, is very busy on Turkish towels, operating 28 looms. The felt department of this mill is almost ready for operation and the dye and bleach plant is equipped and in part operation. They sell direct.

*Rhode Island, Albion. The new building for the Valley Falls Co. is being built under the direction of E. G. Chase, agent of the mill, and W. H. Erskine, supt. It has not been decided at this date as to the number of new spindles and looms which will be needed. The new structure will be 106 by 75 feet and 5 stories high.

*South Carolina, Fountain Inn. The increase at the Fountain Inn Mfg. Company will consist in the enlargement of the mill building and the erection of several cottages. 5,000 spindles and 300 Draper looms will be installed, making a total equipment of 15,000 spindles and 460 looms. Contracts for machinery and buildings have been made. As previously reported, the capital stock of this

company was increased from $200,000 to $300,000 at the stockholder's meeting on March 24 to finance improvements.

*South Carolina, Newberry. The Newberry Cotton Mills are reported as planning for the addition of 10,000 spindles and 30 looms. The present equipment is 28,000 spindles and 900 looms.

*South Carolina, Pendleton. The installation of 8,000 new spindles in the new building recently completed for the Pendleton Cotton Mills, is going forward and it is expected that the entire mill will shortly be rnnning on 20s to 40s single and ply yarns.

Tennessee, Shelbyville. The Sylvan Cotton Mill has filed articles with the Secretary of State increasing the capital stock from $36,000 to $72,000. Osnaburgs and ducks are manufactured on 4,000 ring spindles and 104 looms. W. J. McGill is treas. and buyer.

WOOLEN.

New Mills.

*Canada, Ontario, Georgetown. The Alfred Sykes Company is constructing a plant for the manufacture of carpet yarns, knitting yarns, hosiery and glove linings. They report manufacturing will begin in May, giving employment to 25 hands. One set of woolen cards, 350 spindles, 10 knitting and 3 sewing machines will comprise the equipment. A producer gas plant will be installed. Alfred Sykes is president, treasurer and buyer and Geo. Hayward is superintendent. They are interested in receiving information on knitting machinery, loopers, winders, presses and drying machinery.

Rhode Island, Hope Valley. Thomas H. Hammond, who was of the firm of Youngman & Hammond, before the dissolution of that firm, has sold the Locustville mill property to a new company known as the Locustville Woolen Co., Inc. The officers of the new company are Henry D. Bailey, president, and Edwin M. Canfield, secretary and treasurer. It is reported that manufacturing operations will begin as soon as possible.

*Rhode Island, Providence. Improvements are going forward at the old Chase plant which as previously reported, will be known as the Colored Worsted Mill. A one-story addition 67 by 81 feet is being built. The Colored Worsted Mill will be controlled by James Lister of the Centredale Worsted Mills and will manufacture 2/20s to 2/60s colored worsted yarns. The equipment will consist of 2 combs, 3 cards and 1,064 spindles (Bradford system). The capital stock is $50,000, of which $30,000 has been paid in. B. F. Lister and A. H. Lister, nephews of James Lister, are agent and buyer respectively.

Enlargements and Improvements.

*Connecticut, Rockville. The James J. Regan Mfg. Company advise us that the additional machinery put into No. 3 Mill is to increase the production of overcoatings, Thibets and suitings.

*Connecticut, Stafford Springs. Cyril Johnson is owner of the plant known as the Central Mfg. Company and runs the mill personally, attending to the manufacturing and buying. As previously reported, 4 new looms have been added for the manufacture of their line of kerseys, broadcloths, etc.

Connecticut, Stafford Springs. A new electric lighting plant is being installed in the mill of J. J. & A. D. Ellis.

Connecticut, Talcottville. A number of broad worsted looms are being installed by Talcott Brothers. Additional looms have been ordered and will be installed as soon as received. A fine line of worsted goods is being manufactured and sufficient orders are on hand to keep the plant very busy.

Massachusetts, Blackington. The Blackington Manufacturing Co. is adding a waste saving stop-motion mechanism, invented by Thomas Davis, master mechanic of the mill, and William J. Mahoney, overseer of the spinning department.

Massachusetts, Fitchburg. The Star Worsted Mills have recently installed a set of worsted cards on the Rae System of carding built by the Lombard Machine Co. of Worcester.

*Massachusetts, Fitchburg. Contract for construction work on the superstructure of the new mill for the Sherriff's Worsted Company has been awarded to Wiley & Foss. Work will be started at once and by the terms of the contract the building will be completed, ready for the installation of machinery, by August 1. The building will be of the most improved brick and steel construction, 187 ft. long, 95 inches wide, and one story high, with a saw-tooth roof. The 76 looms now operated by the company will be installed and in addition 24 new looms will be set up.

Massachusetts, Haverhill. The plant of M. T. Stevens and Sons Company is running full time. During the past few weeks twenty new Crompton & Knowles looms were added to the weave room in the old mill. Dress goods are produced.

Massachusetts, Holyoke. In addition to other improvements the Farr Alpaca Co. will install a new ventilating system. Construction work on other improvements is going forward.

Massachusetts, Lowell. The Massachusetts Mohair Plush Co. has ordered a 500 h. p. engine and new boilers, which will be installed and in operation by August 1.

*Massachusetts, South Barre. Construction work has started on the hydro electric plant for the Barre Wool Combing Co., Ltd. The dam and power house will be of concrete steel construction. The turbines will be of the horizontal type built by the S. Morgan Smith Co. The electrical equipment will be furnished by the Westinghouse Electric & Mfg. Co. This plant, although not a large one, being about 350 h. p., will represent the most modern design of hydro-electric construction. The engineer in charge of construction is L. B. Dow of Boston. Current is to be transmitted to the mills of the Barre Wool Combing Co., Ltd., for driving their machinery.

New Hampshire, East Rochester. The Cocheco Woolen Manufacturing Co. has installed a dewing

machine in the finishing department. A number of improvements have been made in this plant during the past few months.

New Jersey, Camden. The Highland Worsted Mills, 9th and State Sts., report that they have been making quite a few addition and improvements to their plant. Within the past year they have had erected a new boiler house in which they have installed new boilers and have also put in new engines. Another story has been added to their cop mill and they have recently added 16 new frames to their spinning department. They are manufacturers of fine worsted yarns, 30s to 100s, Bradford system, operating 16 cards, 16 combs and 13,500 spindles, selling the production through Richard Campion, Mariner and Merchant Building, Philadelphia. They report a fair business.

New Jersey, Passaic. Contractors have a large gang of men at work on the new additions to the Botany Worsted Mills.

Pennsylvania, Chester. The Thompson Worsted Co., 3d and Kingston Sts., worsted combers and top makers on the Bradford system with 3 cards and 4 combs, report that they are running both day and night. This company has in contemplation, when business conditions are in better shape, the building of an addition to their present plant, in which they will install machinery for the spinning of worsted yarns. They have a capital of $12,000. Walter T. Thompson is pres. and Landy B. Brown, sec. and treas.

*Pennsylvania, Darby. Construction work is going forward on the one-story storehouse for the Griswold Worsted Company. The report that the Salt's Textile Company of Bridgeport, Conn., controlled the Griswold is incorrect. They do not take a large per cent. of the output as previously reported. The Griswold Worsted Company manufactures all grades of worsted yarns, particularly mixes and fine yarns.

Pennsylvania, Philadelphia. The Collins & Aikman Co., River Road, Manayunk, report that they have added 54 new looms and are now operating 204 looms on cotton, mohair and linen plushes, velours and car plushes. The officers of the company are C. M. Aikman, president and W. G. Collins, secretary and treasurer. They bleach, dye and finish, and are quite busy.

Pennsylvania, Philadelphia. Stafford's Sons, Krams Ave., Manayunk, who have been manufacturing blankets and robes have added a line of carpet yarns. They are operating 6 sets, 475 mule spindles and 33 broad looms. They dye their product and sell direct.

Pennsylvania, Philadelphia. Messrs. E. H. Morris & Bro., formerly located at Walnut Lane and Freeland Ave., Roxborough, have removed their plant to their new two-story brick building on Walnut Lane, above Main St., Manayunk, which they have equipped with 9 sets and 1,386 mule spindles. Carpet yarns are manufactured and sold direct.

Pennsylvania, Philadelphia. It is reported that Jas. & Geo. D. Bromley, manufacturers of ingrain carpets at Jasper and York Sts., will shut down their mill for two of three weeks for the purpose of installing a new battery of boilers. They operate 150 looms and sell the production direct.

Pennsylvania, Philadelphia. R. Kennedy, who has been operating 12 looms on men's wear at 240 Ashmead St., Germantown, reports that in conjunction with others he will start up the Germantown Worsted Mills, which will absorb his present plant. A material increase will be made in the new mill continuing the manufacture of the same line of goods.

Pennsylvania, Philadelphia. The Artloom Rug Co., operating about 25 looms on seamless rugs, report that the plant will be greatly increased within a short time. The production is sold through W. G. Hockridge & Co., New York. The mill is located at Allegheny Ave. and Front St.

Rhode Island, Woonsocket. The Woonsocket Worsted Co. is installing a set of the latest patent worsted cards built by the Lombard Machine Co., Worcester.

North Carolina, Kernersville. The Lombard Machine Co., Worcester, have recently installed for the Crews Manufacturing Company a set of Rae System Cards complete.

Rhode Island, Providence. The National and Providence Worsted Mills (American Woolen Co.), are making repairs to the dye house, erecting a small addition and repairing roof.

Rhode Island, Tarkiln. In addition to the installment of a new washer, which we reported some time ago, the Oak Valley Mills are installing a new 150 h. p. engine and boiler. The mill buildings are being repaired and every department improved. The plant is shut down temporarily while improvements are completed. Woolen fabrics are manufactured on 21 broad looms. H. E. Mowry is proprietor.

Rhode Island, Woonsocket. The Selkirk Mills (River Spinning Co.), have added a new piece dyeing machine and it is probable that other improvements will be made in the dyeing department.

Mills Starting Up.

Connecticut, Dayville. The carding department in the Davis & Brown Woolen Co. has resumed work and the whole plant will be in operation just as soon as material is prepared.

Kentucky, Mayfield. The Old Woolen Mills have started up after a shut down lasting three weeks.

Massachusetts, Webster. Some of the departments of the Josiah Perry Woolen Mill have started on full time and it is expected that the rest of the mill will shortly return to the full schedule of working hours.

New Hampshire, West Concord. The Crescent Worsted Co. has resumed operations. 3,500 spindles are operated on worsted yarns on the Bradford system. This is a branch of the Crescent Worsted Co. of Lawrence, Mass.

*Oregon. Eugene. The Eugene Woolen Mill Company has resumed manufacturing. The plant was shut down in February to install a new boiler.

Blankets, flannels, robes and a general line of woolens are manufactured.

*Rhode Island, Harrisville. The Glen Worsted Mill, which is a branch of the William Tinkham Company, has started up after a shut down of a few days. Owing to the change to two loom work some of the weavers left, but they are gradually returning to work.

Mills Shutting Down.

New Hampshire, Lebanon. The Carter & Rogers Woolen Mills (Merrimack Woolen Co.) have shut down and it is stated will not be reopened until July 1. 8 sets and 100 broad looms were operated on repellents.

New Hampshire, South Wolfboro. The Wolfboro Woolen Mills, C. W. Springfield & Co., proprietors, are shut down.

New Jersey, Raritan. The management of the Somerset Manufacturing Co. will close one of their mills for an indefinite period and transfer the orders and business to the Raritan Woolen Co. which is under the same management.

SILK.

New Mills.

New Jersey, Paterson. The Madison Winding & Warping Co. has been incorporated with authorized capital stock of $125,000. Thomas J. Parke, Fred G. Blauvelt and Harold S. Krane are the incorporators. Winding and warping will be done on commission and later the manufacture of silk, wool and other textile fabrics will be engaged in. At present the office of the company is located at 674 Madison Ave.

*New Jersey, Paterson. The new Lincoln Silk Company will operate 300 spindles and 20 looms on jacquard silk goods. Electric power will be used. Emil Herts is president and selling agent. David Young is treasurer and superintendent, and Wm. H. Young is agent. The plant will be equipped at once. David Young may be addressed at 140 Market St.

New Jersey, Paterson. Hugo B. Jahn has started a broad silk plant in the Hamilton Mill at 19 Mill St. Initial equipment is 4 looms, which have been installed. Sufficient space has been leased, however, for a large increase and Mr. Jahn expects in the near future to add additional machinery.

*New Jersey, Paterson. The new broad silk plant being started in the Gordon Mill at 7 Mills Street by Harry and Joseph Grimshaw will be known as the Ideal Silk Manufacturing Co. Ten broad looms have already been installed and ten additional looms will be added. The plant is operated by electric power. John Mulligan, 99 Green Street, New York, is selling agent for this concern.

*New Jersey, West New York. The Gerretson Silk Company, reported incorporated early this month, has a capital stock of $25,000 and is erecting a new mill which will be completed and Twenty-four looms will comprise the initial equipment and will be operated on broad silks. A gasolene engine will be installed to supply power. Robert Smith is pres. and supt. of this company and Joel W. W. Swindells is treas. and buyer.

*Rhode Island, Providence. The plant of the Oriental Mfg. Company at the corner of Whipple and Admiral Sts., was bought by Edgar Lowenstein of 88 Broad St., Boston, for $28,250. Mr. Lowenstein was formerly connected with the Champlain Silk Mills of Whitehall, N. Y., and will utilize the Oriental Company's plant for silk manufacturing.

Enlargements and Improvements.

*Connecticut, South Manchester. Construction work has been resumed on the new ribbon mills being erected for Cheney Brothers. In the mill already erected a foundation of tar covered crushed rock is being laid for the ground floor. On the upper floors carpenters and painters are preparing for the installation of machinery. A force of masons and helpers are working on the construction of the second mill. A new steam turbine is to be added.

FAILURES AND SUSPENSIONS.

Massachusetts, Clinton. The Pickford Worsted Co. is reported petitioned into bankruptcy. The petitioners are the Star Worsted Co. of Fitchburg, the Hope Worsted Mills of Louisville, Ky., and the Limerick Mills, Limerick, Maine. Assets and liabilities are not given. The Pickford Co. operated 8 broad looms on men's and women's worsted goods, buying all yarns.

*Massachusetts, Farnumsville. At a meeting of the stockholders of the Excelsior Mills it was voted that an assignee be appointed to have charge of the corporation interests and run the mills until the stock on hand is made into cloth. C. H. Hall of Cambridge was named as assignee and F. B. Smith of Worcester was made co-assignee.

*Massachusetts, Spencer. A petition in bankruptcy has been filed against the Allendale Woolen Co. The liabilities are given as $20,000 and the assets, $9,000. In October, 1907, the plant of the Allendale Woolen Co. was destroyed by fire and nothing has been done since then toward operating the plant.

*Massachusetts, Uxbridge. Creditors of the C. A. Root Company held a meeting at the Essex Hotel, Boston, and appointed a committee to look into the assets and liabilities of the corporation. It is probable that a compromise will be offered and accepted. The mill is shut down and will remain closed until it is decided what will be done toward effecting a settlement with the creditors.

Massachusetts, Wales. Herbert E. Shaw, proprietor of the Berkeley Woolen Mills, has filed a voluntary petition in bankruptcy. His liabilities are $108,372 and assets $3,356. The two heaviest creditors are L. F. Dommerich, $40,892, and F. Vietor Achelis, $32,854. They are secured for the amounts of their claims by consignments of cloth. There are about fifty unsecured creditors.

New York, New York. William Herrick has been appointed by the Supreme Court receiver for J. E. Munich & Co., Inc., manufacturers of silk and textile fabrics at 159 Greene St., with a bond of $6,000 in a suit brought by the directors of the corporation for its voluntary dissolution. Mr. Herrick is vice president and treasurer of the corporation also its largest stockholder and a creditor to the amount of $5,040. William L. Voigt, pres., is a creditor for the sum of $1,674. The liabilities are $10,554 and assets $5,209. The corporation was granted its charter on Dec. 19, 1906, with a capital stock of $50,000 and did a business mainly of printing silks.

Vermont, Ludlow. On petition of creditors the Verd Mont Mills have been placed in the hands of a receiver. Frank A. Walker has been appointed to take charge of the affairs of the company. It is expected that the difficulties will be settled so that the mill will continue operations when market conditions improve.

FIRES.

Massachusetts, Chelsea. About two-fifths of this city was destroyed by a conflagration causing a loss estimated at from $10,000,000 to $12,000,000. The American Circular Loom Company's plant and the Suffolk Knitting Company were in the path of the fire and were destroyed. The other six textile manufacturing plants were not damaged.

Massachusetts, Fall River. Fire caused a loss of about $15,000 in the engine and boiler rooms of the Weetamoe Mills. Practically the whole plant will be shut down until the damage can be repaired.

Pennsylvania, Philadelphia. The one-story frame building used by Mrs. R. Weston for the manufacture of woolen and worsted gloves on 14 knitters was recently burned out, incurring a loss of $2,000.

FACTS AND GOSSIP.

Alabama, Birmingham. The Perfection Mattress Co. are installing two felt machines and will manufacture their own felts in the future.

*California, Los Angeles. Some reports of the proposed new mill would indicate that a company has been formed and is about ready to start manufacturing. Plans have not yet been prepared. The company has not passed the stage of promotion.

Connecticut, East Lyme. The Niantic Mfg. Co. is running the weaving department overtime to fill orders. Dress goods and suitings are manufactured on 8 sets and 39 broad looms. James Bathgate is treasurer, agent and buyer.

Connecticut, Killingly. The Assawaga Woolen Co. is running full time and the carding and spinning departments are running overtime until nine o'clock at night.

*Connecticut, Montville. The report that the Monarch Woolen Mills will get out a line of samples to be submitted to the trade is correct. This plant has been shut down since last October.

*Connecticut, New Boston. Geo. T. Murdock of Geo. T. Murdock & Son, which concern filed a petition in bankruptcy in September, 1907, has been denied a discharge from bankruptcy. A charge is made that Mr. Murdock concealed assets from the creditors.

Connecticut, Plainfield. The Lawton Mills, Corp., has returned to full time.

*Connecticut, Turnerville. It is again reported that Smith & Kauffmann, silk ribbon manufacturers, with plant at 559 W. 132d St., New York City, will purchase the plant formerly operated by P. W. Turner & Company.

Georgia, Brunswick. The Board of Trade is in communication with parties who are looking for a new site for an old established knitting mill.

*Georgia, Eatonton. The Middle Georgia Cotton Mills are in the hands of a receiver. Hiram L. Gardner of this place has been appointed temporary receiver. It is stated the action is taken with a view to winding up the affairs of the mill and in contemplation of a reorganization of the business. Previous reports have stated that the plant will be enlarged and it is probable that an enlargement will take place upon a recorganization of the business.

Georgia, Toccoa. E. W. Schaefer is associated with others in a proposition to manufacture cotton rope. Mr. Schaefer would like to correspond with manufacturers of machinery for this class of work. He may be addressed at Box 184, Toccoa, Ga.

Illinois, Chicago. The Association of Commerce is investigating the advisability of offering inducements for the establishment of woolen and cotton mills in this city.

*Kansas, Leavensworth. It is reported that Witten McDonald of Kansas City, Mo., is interested in a project to organize, build and operate a cotton mill at this place. None of the details have been given out.

Maine, Dexter. The Dunbarton Woolen Mills, which have been running on two-thirds time for a number of weeks, have resumed the full time schedule in all departments except the finishing department. It is understood the latter will resume full time within a week or ten days.

Maine, Old Town. It is reported that C. C. Garland is engaged in a project to build a cotton mill in this city.

Maine, Portland. The Hawkins Textile Machinery Co. has been organized to manufacture and deal in cotton, wool, silk and other fabrics. Capital stock is $100,000, of which nothing has been paid in. H B. Clarity and John T. Fagan of Portland are the incorporators.

Maine, Sanford. The Goodall Worsted Co. is running night and day and the Maine Alpaca Co. is operating its plant full time. The Sanford Mills are still on a 4 day a week schedule, but their prospects are good for shortly returning to the full time schedule.

*Maine, Skowhegan. N. B. K. Brooks has been appointed receiver for the Marston Worsted Co.

The weaving department of the mill is at present shut down, but the dyeing and finishing departments are being run and will continue until the stock in process is finished. Mr. Brooks states that the receiver will operate the mill for the next ten or twelve months and hopes to eventually turn it over to the owners in good condition.

Massachusetts, Boston. Messrs. E. M. Thayer & Company have been erroneously reported in some of the daily papers as being damaged by fire, smoke or water. The fire referred to was at 421 Atlantic Ave., in the building adjoining the one occupied by them. They were not inconvenienced in any way.

*Massachusetts, Charlton City. Akers & Taylor Mfg. Co. are running a number of looms night and day owing to the demand for deliveries on their line of goods. Since the reorganization of the old Akers & Taylor Co. in July, business has been very satisfactory.

Massachusetts, Clinton. The Lancaster Mills have returned to a full time schedule after three weeks of short time. The reduction in wages became operative Monday, without difficulty.

Massachusetts, Brockton. A new firm known as Hutton & Lapworth will occupy a building formerly used by the Old Colony Rand Co. The new concern will manufacture elastic web goods such as elastic belts for women's wear, suspender webs, garter webbing, etc. Eight looms have been ordered of the Crompton-Knowles Co. and will be set up as soon as they arrive. Mr. Lapworth is a son of William Lapworth, manufacturer of webbing at Milford, Mass. Mr. Hutton will have charge of the selling end of the new concern and will handle the finances and Mr. Lapworth will have charge of the manufacturing end. It is expected that manufacturing will begin about April 15.

*Massachusetts, Hudson. The Hudson Fibre Company, previously reported incorporated, has a capital stock of $8,000 and will manufacture absorbent cotton batting and similar lines. James E. Boland is pres. and agent and James E. Boland, Jr., is supt. Eight sets of cards will be operated.

*Massachusetts, Lowell. Owing to the large amount of work on hand, John C. Meyer & Co. will be unable to remove their plant from Jamaica Plain to the Pickering Mill until June or July. As stated in previous reports of these improvements, the equipment will be greatly enlarged.

Massachusetts, Marblehead. C. H. James of Pittsburg, Pa., has leased the Shaw Bldg. and will install a number of sewing machines for the manufacture of fabric gloves.

*Massachusetts, Medford. The Shawmut Finishing Company, reported incorporated with capital stock of $25,000, will occupy the plant of the bankrupt Crown Dyeing Company, as we reported probable last week. Operations began April 6. James D. Lloyd is president and superintendent, Raymer B. Weeden of Providence is treasurer. Chas. A. Hull and others of New York and Providence are interested.

*Massachusetts, Whitinsville. Arthur Rienstra & Company, who are starting a new plant for the manufacture of canton flannel gloves, are interested in receiving information on glove cutting machinery, cloth boards, drying machinery, overseaming machines, presses and similar machinery. Production of goods began March 16.

New Jersey, Camden. The Lee Thread Co., 416 Line St., is one of the new concerns which has recently been started in this city, J. C. Lee being the proprietor and Frank McAlister, superintendent. They are manufacturing cotton and woolen waste for wiping and packing purposes and willowed cotton, having in operation 1 shredder, 1 cutter, 1 willow and 1 cleaner, electricity being the motive power, each machine being equipped with an individual motor. They report a good business and sell direct.

*New Jersey, Camden. The Standard Combed Thread Co., reported by us at the time of its incorporation several months ago, has a capital of $50,000; Thomas Lee, pres., and W. B. Caminade, sec. and treas. The plant is located at 2d and Erie Sts., in the buildings formerly occupied by the Camden Wool Stock Co., now out of existence, which they have equipped with 8 combs, 7 cards, 4 garnetts, 7 shoddy pickers and 4 carbonizers which they are operating on wool stocks and wool packing threads, selling direct. Thomas Lee is the buyer.

*New Mexico, Albuquerque. The Albuquerque Wool Scouring Mills have filed a certificate with the Secretary of the Territory increasing its capital stock from $75,000 to $100,000. An addition was recently made to the plant and another wool washing machine installed.

*New York, New York. The Yazoo Mills, reported incorporated with capital stock of $10,000, will manufacture yarns and twines from cotton, jute, flax, manilla and sisal. A plant will be equipped with 2,000 spindles and driven by electricity. Wm. R. Berryman is president and buyer and Geo. B. Marshall is treasurer. At present the plant is being built. The product will be sold direct. They are interested in receiving information on machinery equipment and supplies. Mr. Berryman may be addressed at 192 West Broadway.

Ohio, Piqua. The Piqua Bleaching & Dyeing Co. have recently contracted with Hungerford & Terry, filtration engineers, located in the Pennsylvania Bldg., 15th and Chestnut Sts., Philadelphia, for the installation of one of their latest improved filtration plants with a daily capacity of 150,000 gallons. The work will be commenced at once and pushed speedily forward to completion.

Pennsylvania, Philadelphia. Messrs. Brehm & Stehle, Trenton and Allegheny Avenues, buyers of cotton, woolen and mixed yarns, jute and twines, are asking for bids, from plans already prepared, for a 3 1/2 story addition to their present buildings.

Pennsylvania, Philadelphia. Gordon Bros., Orthodox and Pierce Sts., Frankford, manufacturers of hair cloth, weaving and brush hair, report a good business. They have recently increased their equipment to 200 looms.

Personals.

Alfred Stoker has accepted the position as overseer of weaving at the Nanquit Worsted Company, Bristol, R. I. He was formerly employed at the C. A. Root Company, Uxbridge, Mass.

James H. Paiton has accepted a position as overseer of the back filling department for Jos. Bancroft & Sons company, Ltd., Wilmington, Del. He was formerly employed at Pawtucket, R. I.

Harry E. Houghton, overseer of carding at the Globe Mills, Woonsocket, R. I., has accepted a similar position with the Fisherville Mfg. Company, Fisherville, Mass. John Stewart, Burgess Mills, Pawtucket, R. I., succeeds him.

Geo. A. Bassett has accepted the position as overseer of carding at the Dodge-Davis Mfg. Company, Bristol, N. H. He was formerly employed at the Hecla Mills, Uxbridge, Mass.

Chas. R. Newton, superintendent for the Ray Mills, American Woolen Company, Franklin, Mass., has severed his connection with that company.

Edward T. Tibbetts, for 60 years an industrious worked in the cotton manufacturing business and 27 years employed at the Monohansett Company of Putnam, Conn., as overseer of carding, has resigned. His successor is C. C. Chase, of Shelton, Conn.

Forest Johnson has accepted the position as overseer of dyeing at the Tremont Worsted Company, Methuen, Mass., succeeding Geo. Davis, who recently accepted a position at Winooski, Vt.

John G. Kearns has accepted the position as overseer of finishing at the Premier Worsted Mills, Wickford, R. I. He comes from Uxbridge, Mass., succeeding Martin Nelson, who resigned.

Herman E. Vogel has accepted the position as overseer of dyeing at the Bemis Mills, Watertown, Mass. He was formerly employed at the Aetna Mills, same town, and succeeds E. Thornton, who resigned.

Wm. Nabors, formerly of Danville, Va., is now overseer of carding at Enoree, S. C. J. H. Huff has taken charge of the spinning.

Clair Brigham, night superintendent at the Arlington Mills, Gastonia, N. C., has resigned and accepted a position as superintendent of the Holland Mills, same city.

J. E. Reese, section hand in the carding department at Edgefield, S. C., has accepted a similar position at the Olympia Mills, Columbia, S. C.

J. H. Anderson, for the past year in charge of carding and spinning at mills in Georgia and Alabama, is now located at Ashboro, N. C.

D. F. Poole, overseer of weaving at Eastman, Ga., has resigned and accepted a similar position at Natchez, Miss.

Chas. J. Trippe, for the past three years overseer of spinning at Darlington, S. C., has accepted a similar position with the Laurens Cotton Mills, Laurens, S. C.

A. H. Murray has been promoted to the position as overseer of spinning, nights, at the Revolution Mills, Greensboro, N. C. He was formerly employed as second hand days.

James Hogue, second hand in the No. 1 weave room, has been given in addition to his present duties the No. 2 weave room, at Trion, Ga.

Robert Schooler, designer at the Ray Mills, American Woolen Company, Franklin, Mass., succeeds Chas. R. Newton as superintendent. He will also look after the designing.

Wm. C. Bennett has accepted the position as overseer of carding at the Adams Mfg. Company, Shelton, Conn. He was formerly employed at Garner & Company, Newburgh, N. Y., formerly the Newburgh Steam Cotton Mills.

B. W. Washburn has accepted the position as overseer of dyeing for James & E. H. Wilson, Pittsfield, Mass. He was formerly employed at the Blackinton Mfg. Company, Blackinton, Mass.

W. P. Campbell, who resigned as superintendent at the Lafayette Cotton Mills, Lafayette, Ga., some time ago, has recently accepted a position as traveling salesman.

J. H. Turner, overseer of carding, has been promoted to the position as superintendent of the mill at Enoree, S. C., succeeding R. L. Walker, who resigned.

S. C. Rush, master mechanic at Dillon, S. C., has resigned to take charge of the machine shop at Enoree, S. C.

M. O. Dean, formerly head designer at the Dwight Mfg. Company's Mill, Chicopee, Mass., has been employed as superintendent of the weaving, a new position recently created. Oliver D. Drew, formerly superintendent, will have charge of all departments, with the exception of the weaving. Thomas Cousins, assistant designer, has been appointed designer.

Daniel Shea of Meriden, Conn., succeeds James McGeough as overseer of finishing at the Rock Mills, Rockville, Conn.

Ellis S. Willis, superintendent of departments 11 and 12 at the New England Cotton Yarn Company, Taunton, Mass., has severed his connection wtih that company.

Wm. Newton, night overseer in the full fashioned department of the Sulloway Mills, Franklin Falls, N. H., has severed his connection with that company and accepted a similar position with the British Hosiery Company, Providence, R. I.

Christopher P. Brooks has been appointed by president Wm. D. Hartshorne of the National Association of Cotton Manufacturers, one of the five delegates to the Fifth International Congress.

Frederick H. Taber has been elected treasurer of the Taber Mills, New Bedford, Mass., to fill the vacancy caused by the resignation of Rufus Soule, Jr.

Eugene E. Fenton, overseer of the sewing and burling departments at the Geo. H. Gilbert Mfg. Company, Gilbertville, Mass., has resigned and accepted a similar position with the Arlington Mills, Lawrence, Mass.

Henry Homer, overseer in the jack spinning department of the Bigelow Carpet Company, Lowell, Mass., has resigned and also Michael Cohen, overseer in the wool carding department.

August F. Homer has accepted the position as machinist at the Beaver Brook Mills, Collinsville, Mass.

Fred Smith has accepted a position as second hand in the dye house at the Clyde Print Works, Clyde, R. I.

W. H. Manning, overseer of spooling, warping, winding, twisting and slashing at the Warner Cotton Mills, Newburyport, Mass., has severed his connection with that company. He is succeeded by Henry Le Maye of the Tremont & Suffolk Mills, Lowell, Mass.

George Thomayer has accepted the position as overseer of knitting for the Watson Mfg. Company, Paris, Ont., Canada. He comes from Bennington, Vt.

Chas. E. Haynes, for the past five years overseer of spinning, spooling, warping and twisting at the Whitman Mills, No. 2, New Bedford, Mass., has resigned and accepted the position as superintendent of a mill at Bristol, R. I. The position has been filled by Mr. Davis, overseer of spinning at the Danielson Cotton Company, Danielson, Conn.

William H. Horne, overseer at the Jenckes Spinning Company, Pawtucket, R. I., has severed his connection with that company.

Emil Heneault has severed his connection with the Taconic Mills, Pittsfield, Mass., as overseer of dyeing.

John Phillips, second hand in the carding department at the Grosvenordale Company, Grosvenordale, Conn., has resigned and accepted an overseer's position at the Queen City Mills, Burlington, Vt.

Joseph Michey has accepted a position as designer for the Aberfoyle Company, Chester, Pa., succeeding Samuel B. McCullough.

E. A. Mongeon, superintendent of the Lonsdale Company, Lonsdale, R. I., is to sever his connection with that company, to take effect June 1. He has held the position since 1900 and was formerly superintendent of the Blackstone Mfg. Company, Blackstone, Mass.

John F. Bagley has accepted the position as overseer of carding for the Cleveland Woolen Mills, Cleveland, Tenn. He was formerly employed at Lowell, Mass.

John Kelly, foreman of the spooling and twisting department of the Forestdale Mfg. Company, Forestdale, R. I., has severed his connection with that company. His successor will be John Bradshaw.

H. D. Massey has accepted the position as overseer of carding for the Manetta Mills, Lando, S. C. He comes from Winnsboro, S. C.

Eugene Sullivan has accepted the position as overseer of spinning at the Passaic Woolen Company, Passaic, N. J. He comes from Otter River, Mass.

F. R. Duncan has accepted a position as overseer of carding at the Fidelity Mfg. Company, Charlotte, N. C. Chas. Williams has taken the position as overseer of spinning for the same company.

E. L. Sargent, for the past three years superintendent of the Atherton Mills, Charlotte, N. C., has accepted a position as superintendent of the Fidelity Mfg. Company, Charlotte, N. C.

W. J. Burnett has resigned the position as overseer of carding at the Loray Mills, Gastonia, N. C., and accepted a more satisfactory position elsewhere.

H. E. Erwin has accepted a position as overseer of spinning at Mayesworth, N. C.

David Bishop has accepted a position as superintendent of the No. 3 Mill of the Southern Mfg. Company, Athens, Ga. He comes from Griffin, Ga.

B. C. Whittle has accepted a position as overseer of weaving, slashing and web drawing at the Eastman Cotton Mills, Eastman, Ga. He was formerly employed at Augusta, Ga.

F. N. Spooner has accepted the position as master mechanic for the Grant Yarn Company, Fitchburg, Mass. He was formerly employed at the E. Jenckes Mfg. Company, Pawtucket, R. I.

J. T. Coal, overseer of spinning and twisting at the York Cotton Mills, Yorkville, S. C., has resigned.

H. G. Tucker, overseer of carding and spinning at the Medway Mills, and who has been holding a similar position at the Alpine Mills, Morganton, N. C., for the past year, has accepted a similar position with the Pee Dee No. 1 mill at Rockingham, N. C.

Chas. E. Haynes, overseer of spinning at the Natick Mills, Natick, R. I., has been appointed superintendent of the Grant Mills, Providence, R. I. This mill is controlled by B. B. & R Knight.

Fred Smith, overseer of English worsted spinning at the Wood Worsted Mills, Lawrence, Mass., has been appointed superintendent of the worsted yarn department, succeeding Walter M. LeMont, who has been appointed assistant agent.

John F. Burns, overseer in the brussel department of the Bigelow Carpet Company, Lowell, Mass., has severed his connection with that company.

Wm. E. Pengalley, overseer of carding at the Fisher Mfg. Company, Fisherville, Mass., has severed his connection with that company. He was presented with a traveling bag and a silver mounted shaving outfit by the help employed in the carding department.

Robert Fazackerley has accepted a position as overseer of weaving at the Dominion Textile Company, Ltd., Montmorency Falls, Que., Canada. He was formerly employed in different mills in Canada.

James Lamb, overseer of finishing at the National & Providence Worsted Company, Providence, R. I., has been appointed superintendent to succeed Alfred Lockwood, who resigned.

Jos. Ray, master mechanic at the Berkeley Mills, Ashton, R. I., has severed his connection with that company after 15 years of service.

Geo. W. Gerry, overseer of spinning at the Beaver Brook Mills, Collinsville, Mass., has severed his connection with that company.

Allen Osborne has been appointed superintendent of the Strathmore Worsted Mills, Concord Junction, Mass. He was formerly employed at the Weybosset Mills, Providence, R. I.

Ladd J. Lewis, president of the Adrian Knitting Company, Adrian, Mich., is a candidate for the office of mayor of that city.

Wm. A. Booth has accepted the position as overseer of weaving at the Taconic Mills, James & E. H. Wilson, Pittsfield, Mass. He comes from Springfield, Mass.

F. E. Kent, manager of the Unity Worsted Mills, Philadelphia, Pa., has severed his connection with that company and accepted a similar position with Long Bros. Company.

Fred C. Herver has accepted a position as assistant superintendent for the American Woolen Company's Mill at Fulton, N. Y. He was formerly employed at the Schaghticoke Mills, Schaghticoke, N. Y.

Wm. McElwain, overseer of dyeing at the North Berwick Woolen Company, North Berwick, Me., has severed his connection with that company and accepted a similar position with the Rochester Woolen Company, Rochester, N. H.

Alfred Lockwood, for a number of years superintendent for the National & Providence Worsted Mills, American Woolen Company, Providence. R. I., has severed his connection with that company.

Thomas James has accepted a position as superintendent of the Southwark Mills Company, Philadelphia, Pa., succeeding David Patchell.

Wm. R. Gosling has accepted a position as superintendent of the corduroy weaving at the Boott Mills, Lowell, Mass. Was formerly employed at the No. 1 New York Mills, New York Mills, N. Y.

Geo. E. Richardson, electrician for the Lancaster Mills, Clinton, Mass., for the past 9 years, has severed his connection with that company and accepted a responsible position in the sales department at the General Electric Company, at their Boston office.

Wm. Lockett, superintendent and designer at the Vernon Woolen Company, Vernon, Conn., for the past twenty years, has resigned and accepted a position as designer at W. E. Tillotson Mills, Pittsfield, Mass.

Wm. H. Rider has accepted a position as superintendent at the Somerset Worsted Mills, East Madison, Me. He was formerly employed at Clinton, Mass.

John Lenahan for the past 18 months overseer of finishing at the Oneko Woolen Mills, New Bedford, Mass., has severed his connection with that company and accepted a similar position at the National & Providence Worsted Mills, American Woolen Company, Providence, R. I.

Martin J. Nelson has accepted a position in the finishing department at the La Porte Woolen Mills, La Porte, Ind. He was formerly employed at Wickford, R. I.

Wm. J. Eastham, superintendent of the Grant Mills, Carpenter St., Providence, R. I., one of the mills controlled by B. B. & R. Knight, has severed his connection with that company after 17 years of service.

Harry Holmes has accepted a position in charge of worsted machinery for Birch & Son, Philadelphia, Pa.

John Foy has taken charge of the worsted twisting department at the Grundy's Worsted Mills, Bristol, Pa. He was formerly employed at the Cleveland Worsted Mills, Cleveland, Ohio.

Geo. A. Judson has accepted a position as overseer of finishing at the Talbert Mills, North Billerica, Mass. He comes from the Worcester Textile Machinery Co., Worcester, Mass.

John McGuire has accepted a position as overseer of finishing at the Mayo Woolen Company, Millbury, Mass., succeeding Mr. Hall, who resigned to accept a position at the Merrimack Mills, Dracut, Mass.

Chas. Miliner, for the past 15 years overseer in one of the departments of the Crompton Company's Mill, Arctic, R. I., has severed his connection with that company.

Peter C. Costello, Sr., has accepted the position as overseer of finishing at the Morrison Woolen Company, Dexter, Me.

Frederick Macy, treasurer of the Soule Mills, New Bedford, Mass., has been elected treasurer of the Taber Mills in addition to his other duties.

Jos. Cookson has accepted the position as overseer of weaving at the Newmarket Mfg. Company, Newmarket, N. H. He was formerly employed at the Acushnet Mills, New Bedford, Mass.

Geo. E. Spofford, superintendent of the Blackstone Mfg. Company, Blackstone, Mass., has been appointed agent of the Lonsdale Company's Mills at Lonsdale and Ashton, R. I., succeeding E. A. Mongeon. Mr. Spofford has been connected with the Blackstone Mfg. Company for a number of years and his departure will be felt by the town's people and also by those engaged in the mill, as he was very popular.

Sterling Greydon has accepted a position as general superintendent of the Atherton Mills, Charlotte, N. C., succeeding E. L. Sargent.

James McLaughlin has accepted the position as overseer of finishing at the Knoxville Woolen Mills, Knoxville, Tenn.

J. Phillips has accepted the position as overseer of carding at the Queen City Cotton Mills, Burlington, Vt. He comes from Grosvenordale, Conn.

Major J. Turner Moorhead, a pioneer cotton and woolen manufacturer of Leaksville & Spray, N. C., died April 20 in New York City, where he had recently made his home, at the age of 68 years.

Herbert Taylor, superintendent of the C. B. Alling Mill, Derby, Conn., has severed his connection with that company after six years of service. He has not as yet decided on his future plans, but may take a trip abroad for the summer.

David Lawton, overseer of finishing at the Blackstone Stocking Company, Central Falls, R. I., has severed his connection with that company.

T. Frank Carr has accepted a position with the Ipswich Mills, Ipswich, Mass. He was formerly employed at the New England Cotton Yarn Company, Taunton, Mass., as one of the clerical force.

Thomas Fitzpatrick, overseer of the carding department at the Hartford Carpet Company, Thompsonville, Conn., for the past nine years, has severed his connection with that company to accept a similar position with the New England Knitting Company, Winsted, Conn.

Guy Bleakley has accepted the position as overseer of knitting at the Atlas Underwear Company, Piqua, Ohio. He comes from A. S. Staley Mfg. Company, South Bend, Ind.

Percy Crowther has accepted the position as second hand in the dye house at the Oneita Knitting Mills, Utica, N. Y. He was formerly employed at Rochester, N. Y.

Nash Simonds, superintendent of the Hillsboro Mills, Wilton, N. H., for the past 35 years, has severed his connection with that company. W. G. Abbott, son of Wm. G. Abbott, president of the mill, will succeed Mr. Simonds.

Wm. T. Burke has accepted a position as overseer of burling and mending at the Pequea Mills, Philadelphia, Pa

Chas. A. Gaucher, pay master at the Lawrence Felting Mills, Millville, Mass., has severed his connection with that company.

Blair Bingham has accepted a position as superintendent of the Holland Mfg. Company, Gastonia, N. C. He was formerly employed at the Arlington Cotton Mills, same city.

E. T. Barnes, for the past two years overseer of spinning and assistant superintendent at the Siluria Cotton Mills Company, Siluria, Ala., is now employed at the Fulton Bag & Cotton Mills, Atlanta, Ga.

L. T. Curry has resigned the position as overseer of weaving at the No. 4 Mill at Pelzer, S. C.

J. M. Alexander has been appointed superintendent of the No. 4 Mill at Pelzer, S. C.

J. H. Merritt has been appointed superintendent of the three mills at Pelzer, S. C.

W. H. Hiden has accepted a position as overseer of weaving at Stonewall, Miss. He comes from the Steele Mills, Cordova, Ala.

Weldon Bridge has accepted a position as overseer of carding at the Elizabeth Mills, Charlotte, N. C. He comes from the Daniel Mills, Lincolnton, N. C.

F. A. Wright has accepted a position as overseer of the cloth room at the Aragon Mills, Rock Hill, S. C., succeeding J. D. Strange.

J. W. Burnett, overseer of carding at the Loray Mill, Gastonia, N. C., has decided to remain with this company, having given in his notice a short time ago.

J. L. Collins has accepted a position as overseer of the cloth room in the Fairfield Cotton Mills, Winnsboro, S. C., succeeding F. A. Wright.

T. M. McIntire has been promoted to the position as superintendent of the Loray Mill, Gastonia, N. C.

Wm. E. Davidson has accepted a position as designer for the Putnam Woolen Company, Putnam, Conn. He was formerly employed at the Calumet Woolen Mills, Uxbridge, Mass.

F. E. Clement, superintendent of the Unity Woolen & Worsted Company, Philadelphia, has severed his connection with that company and accepted a similar position with the Long Bros. Company, Quaker City Mills.

Walter McCook has been appointed selling agent for the Woonsocket Worsted Mills and the Stafford Worsted Company of Stafford Springs, Conn., with office at Philadelphia.

Ethel Birch, the little daughter of Albert Birch, proprietor of the Somerville Machine Works, died on April 15. The funeral is on Saturday at 2 P. M. at the family residence, 56 Fairview St., Belmont, Mass.

Geo. Wishart, overseer of dyeing at the Assawaga Company, Dayville, Conn., has resigned.

Silas Rooney, who has been boss carder for the West Boylston Manufacturing Company at Easthampton, Mass., has severed his connection with that company and taken a similar position with the Mohawk Valley Cap Factory at Utica, N. Y.

J. L. Wood has recently returned from Mexico where he has been for the past six months installing a comfort and mattress plant for the E. B. Welch Co. He has taken again his old position as superintendent for the Livingstone Manufacturing Co. and is cordially welcomed back by his former employers and his many friends who are glad to have him with them once more.

John Mills has severed his connection as overseer of weaving at the Newmarket Mfg. Company, Newmarket, N. H.

Robert Armstrong has accepted the position as overseer of dyeing at the Cowan Woolen Company, Lewiston, Me. He was formerly employed at the River Spinning Company, Woonsocket, R. I., and later with the Carolina Mills Company, Carolina, R. I.

C. Enos Bean of Tennille, Ga., is to have charge of the building of the Majestic Mill, Belmont, N. C. He takes up his new duties May 1st.

John Kirvin, overseer of carding at the Pontoosuc Mills, Pittsfield, Mass., has severed his connection with that company.

Geo. Haigh has been promoted to the position as head designer at the Globe Woolen Mills, Utica, N. Y.

Thomas H. Rennie, who has been superintendent of the Graniteville Manufacturing Co., Graniteville, S. C., for a number of years, is to become the president and general manager of the Pell City Mfg. Co., Pell City, Alabama. G. W. Pratt, the present president, has tendered his resignation. A.

J. Draper of Spray, N. C., is treasurer of this mill and C. E. Riley & Co. of Boston are the selling agents. The equipment is 25,000 spindles and 800 looms on denim. Mr. Rennie is one of the best known manufacturers in the South and has an equally wide circle of friends in the North.

Benj. Ayers, overseer of finishing at the Talbot Mills, North Billerica, Mass., has severed his connection with that company.

Harry J. Geb has accepted the position as designer at the H. T. Hayward Mill, Franklin, Mass. He was formerly engaged with the Saranac Mills, Blackstone, Mass.

Arthur J. Peterson, assistant dyer at the Bay State Mills, Lowell, Mass., has resigned and accepted a position as overseer of dyeing at the Auburn Woolen Company, Peterboro, Ont., Canada.

John E. Graham, overseer of dyeing at the Bay State Mills, Lowell, Mass., has resigned.

Homer E. Emery, overseer of spinning at A. V. Morris & Company, Amsterdam, N. Y., has resigned.

Wm. Pengally, overseer of finishing at the Fisher Mfg. Company, Fisherville, Mass., has severed his connection wtih that company.

E. C. Sherman, pay master at the Saranac Mills, Blackstone, Mass., has resigned. The position has been filled by Adnah W. Ham, formerly connected with the Atlantic Mills, Providence, R. I.

T. M. McIntire has been appointed superintendent of the Loray Mills, Gastonia, N. C., succeeding D. J. Dobbins.

Alfred J. Law, overseer of weaving at the Merchant's No. 3 Mill, Fall River, Mass., has been promoted to the position as overseer of weaving of Mills No. 1 and 2 to succeed Patrick Sullivan who recently retired.

Harry C. Lancaster has been promoted to the position as overseer of weaving of the No. 3 Merchant's Mill, Fall River, Mass., succeeding Alfred J. Law.

Thos. Mallalieu, overseer of the cloth room at the No. 1 Merchant's Mill, Fall River, Mass., has resigned.

Chas. R. Morley, superintendent of the Amsterdam Silk Mills, Fultonville, N. Y., has been appointed superintendent of the Starin Silk Fabric Company's plant.

Benjamin Horsfall, formerly dyer at the Robinson Mills, South Windham, Me., but more recently with the Belle Vue Mills, Clinton, Mass., has severed his connection with that company.

Percy C. Gullin, superintendent of the Merrimack Print Works, Lowell, Mass., sailed for Europe April 15. It is understood that the trip will be one of business and pleasure combined. He will visit Manchester and other important manufacturing cities.

E. Morrow has been appointed overseer of carding at Jos. Noone's Sons Company, Peterboro, N. H., succeeding Wm. Cobbett, who resigned.

J. P. Sample has accepted a position with the ated with us as director and who has been secre-Slayden-Kirksey Woolen Mills, Waco, Texas. He was formerly employed as superintendent of the Water Works System at Waco, Texas.

Emil De Witte has accepted a position as overseer of dyeing for the Assawauga Company, Dayville, Conn. He comes from Woonsocket, R. I.

Simon Taylor has accepted the position as superintendent at the St. Cloud Woolen Company, St. Cloud, Minn. Was formerly at Spencer, Mass.

Carl Norberg has accepted the position as overseer of weaving for the Locustville Woolen Company, Hope Valley, R. I., a concern who has recently taken over the Youngman & Hammond Woolen Mills of this place.

Bennett Whitehead, second hand in the spinning department at the Arlington Mills, Lawrence, Mass., has accepted a position as overseer of spinning at the Wood Worsted Mills, to succeed Fred Smith who has been appointed superintendent of the Wood Worsted Mills.

Albert W. Lockwood, superintendent of the National & Providence Mills, Providence, R. I., has accepted a position as manager of the Jamestown Worsted Mills, Jamestown, N. Y.

Jos. McConnell, overseer of the wash department at the H. L. Welch Hosiery Company, Waterville, Me., has resigned after 38 years of service.

Frederick L. Barstow has been appointed overseer of the dyeing department at the Arlington Mills, Lawrence, Mass. He was for a number of years employed in the chemistry department of the same mill.

Benjamin O'Hara has accepted the position as cloth inspector in the weave room at the Nemasket Worsted Mills, Middleboro, Mass.

John S. Heys has accepted the position as overseer of the picking department for the Boston Duck Company, Bondsville, Mass. He was formerly employed at Indian Orchard, Mass.

James Donaldson has accepted a position as overseer of dyeing for the Champlain Silk Mills, Whitehall, N. Y. He was formerly employed at Pawtucket, R. I.

James Dogherty has accepted the position as second hand in the machine shop at the Taconic Mills, Pittsfield, Mass. He comes from the Assabet Mills, Maynard, Mass.

Thos. J. Gage has accepted a position as overseer of weaving at the Millers River Mfg. Company, Athol, Mass.

Arthur E. Robinson has severed his connection with the Riverside Woolen Mills, Stafford Springs, Conn., as overseer of dyeing.

Geo. Wishart, overseer of dyeing at the Assawaga Company, Dayvilie, Conn., has resigned.

E. G. Talbert has accepted a position as overseer of dyeing at the Saugus Mfg. Company, Saugus, Mass.

Albert Prey has accepted a position as overseer of ring spinning at the Danielson Cotton Company, Danielson, Conn. He was formerly employed at Pawtucket, R. I.

James Horsfall, formerly employed at the Merrimack Mills, Dracut, Mass., has accepted a position as overseer of dyeing at the Bay State Mills, Lowell, Mass.

Frank J. Daley has accepted the position as overseer of knitting for the Central Knitting Mills, Camillus, N. Y. He comes from Little Falls, N. Y.

Harry Haigh has accepted the position as overseer of dyeing at the Saugus Mfg. Company, Saugus, Mass. He was formerly employed as second hand at the R. I. Worsted Company, Stafford Springs, Conn.

J. F. Tuite has accepted a position as overseer of dyeing at the Cheshire Mills, Harrisville, R. I. He was formerly employed at Tilton, N. H.

DEATHS.

William A. Courtnay, president of the Courtnay Mfg. Company, manufacturers of cotton goods, died at his home in Charleston, S. C., aged 65 years. He had been president of this company since its organization in 1903. He was formerly mayor of Charleston.

John Scholes, senior member of the firm of Wm. Scholes & Son Company, Philadelphia, Pa., wool and worsted, carpet and rug yarn manufacturers, died of heart disease at his home in that city at the age of 72 years. He had been manager of the concern for a number of years.

Richard H. Weld, president of the Ludlow Manufacturers' Association, Ludlow, Mass., died in Boston Tuesday night, March 31. He was a graduate of Harvard College, class of 1856. On graduating he became associated with his father, with whom he remained until the outbreak of the Civil War, when he enlisted with a commission as captain in the 44th Mass. Regiment. He was vice president and proprietor of the Market National Bank and president of the Southwark Fruit Company.

Francis Russell Marble, one of the well known manufacturers of textile machinery in New England, died at his home, 29 Webster St., Worcester, after a long illness at the age of 74 years. He was born in Sutton, Mass., and a son of Royal T. and Annie B. (Clement) Marble. In 1841 with his parents he moved to Worcester and in 1852 he began as an apprentice to learn the machinist's trade at Thayer & Houghton Company. With his brother, Hon. Edward T. Marble, the firm of Curtis & Marble was formed with factories on Webster Sq. He acted as superintendent of the shop until November, 1889, when he was forced to retire from active business owing to ill health.

Walter Edward Chipman died at his home in Wheelocksville, Uxbridge, Mass., at the age of 46 years. Mr. Chipman had been second hand in the carding department at the Hecla Mills, Uxbridge, for a number of years. He leaves a wife and one son.

Hippolyte Benard, a pioneer silk manufacturer of Scranton, Pa., died at his home on Pittston Ave., after a three months' illness, aged 75 years. He is survived by his wife and several children.

S. L. Willard, vice-president of the New Bedford Cordage Company, died recently and funeral services were held at Brooklyn, N. Y.

Richard J. Love, for a number of years overseer of weaving in different mills at Pascoag and Mapleville, R. I., died at his home in Pascoag, R. I., Friday, March 27, after a short illness. He was 62 years of age and leaves a wife, three sons and five daughters.

Johnson Barbour, formerly a silk manufacturer of Paterson, N. J., died in Hightown, Manchester, England, after a short illness, at the age of 50 years. He came to this country in 1886 and was one of the founders of the Banner Silk Company of Paterson, N. J.

Edgar A. Hunt, a glove manufacturer at 504 Fulton St., Brooklyn, N. Y., died at Dr. W. T. Bull's Sanitarium, 33 E. 33d St., April 10, after being injured by an automobile a short time ago.

Wm C. Lambeth, prominent in the woolen business in New York City, died suddenly on Saturady, April 11, at his home 848 Evergreen Pl., East Orange, N. J.

David R. Straw died at his home in Guilford, Me., April 18. He was largely instrumental in making the Piscataquis Woolen Mills what it is today and was one of the incorporators of the concern.

William Warren, president of the Wm. Warren Thread Works, Westfield, Mass., died at his home in Cambridge on Tuesday, April 14, at the age of 74 years. He established the Warren Thread Company about 40 years ago. The business was moved from Ashland to Worcester and from there to Westfield. He is survived by his wife, one daughter and two sons.

William Hays died at his home, 147 Garden St., Pawtucket, R. I., March 28, after a few days' illness. He was born in that city in 1858, and had been employed a number of years at the Union Wadding Company as foreman.

Henry Geibelshausen, a silk manufacturer of Paterson, N. J., committed suicide at the Bellevue Hotel by inhaling gas. He was 40 years of age, married and lived at Haledon, N. J.

Frank Gainor, aged 46, and for ten years bookkeeper for the Whitney Woolen Mills, South Royalston, Mass., was found dead in his sleeping room over the mill office. He had not been seen for two days, and on forcing the door his body was found on the floor. An examination showed that Mr. Gainor, who for a long time had been subject to hemorrhages, had died while suffering from a stroke of apoplexy.

Lorenzo C. Dam, an overseer in the employ of the Lyman Mills, Holyoke, Mass., for the past twenty years, died at his home in that city after a lingering illness.

Edward L. Hawkins, a well known cotton broker at Fall River, Mass., died at his home in that city March 25.

Malcolm J. McCloud, son of Chas. M. McCloud of the firm of Chas. M. McCloud & Company, yarn dealers, 229 Chestnut St., Philadelphia, died at his home at Saranac Lake, N. Y., March 24.

James Cyr, overseer of carding at the Dodge-Davis Woolen Mills, Bristol, N. H., died very suddenly in that town at the age of 50 years.

New Publications.

[Any work noticed under this head can be obtained through the office of this journal.]

Plan and Scope of the Industrial Law League; Industrial Law League, Inc., New York.

The object of this booklet is to explain the nature of the Industrial Law League, Inc., and the business it is engaged in; also to place before the public the departments and personnel of the organization. Much valuable material on the subject of United States and foreign patents, trade marks and copyrights is given. The treatment of these subjects at some length gives the booklet value as a reference on these subjects.

Malefactors of Great Wealth; by Roswell A. Benedict, A. M., of the New York Bar; 462 pages; American Business Bureau, 29 Broadway, New York; Price, $1.50.

The author of this book presents a most convincing argument in favor of the maintenance of a high protective tariff and of thoroughly harmonious cooperation between the head and the hands of our industrial system; that is, between capital and labor. He shows conclusively that protection is necessary in order to keep capital and labor profitably employed in this country. The book is written in the form of an argument before a court; in this case it is an appeal to the court of fair play from the decision of Judge Lynch. It appears at an opportune time, when ten years of prosperity has brought on the stage a large number who have not yet learned by bitter experience that a low tariff means hard times, when political leaders have been intrusted with power and are seeking to mould public policies who have had no practical experience in tariff revision. The exposure of the importing trust is especially effective. Mr. Benedict shows how this combination of importing interests, united by the common object of removing obstacles to the purchase of foreign goods, is working constantly to break down the tariff that protects American industry.

The Cotton Plants of the World; by Sir George Watt; 383 pages, 6 by 9; Longmans, Green & Co., New York; price, $9.00.

This is a very valuable treatise on the cotton plants of the world, written by a man who has for years made a close study of the subject. It begins with a history of cotton and cotton industry, the rest of the work being divided into the following sections: The Cotton Fibers, Species, Varieties and Races of the Cotton Plant; Improvement of the Cotton Plant

It is a valuable reference book for the cotton planter and all who are interested in the improvement of the cotton crop. It is embellished with many high grade illustrations, part of which are colored.

Scientific and Technical Terms in Foreign Languages (Rechtschreibung der naturwissenschaftlichen und technischen Fremdwoerter); by Dr. Hubert Jansen; Verein Deutscher Ingenieure. 122 pages, 6 1/2 by 9. Price 75 cents.

This book contains a list of scientific and technical terms in foreign languages, the object being to give the spelling and writing of these words as authorized by the Verein Deutscher Ingenieure, the association that is now engaged in compiling a comprehensive technical lexicon in English, French and German.

Cotton Spinning Calculations and Yarn Costs; by James Winterbottom; 254 pages, 6 by 9; Longmans, Green & Co., New York; price, $3.00.

This book gives in detail particulars regarding gearing of all machines used in cotton spinning, together with the method of calculating the trains of gearing. It also deals with the effects of twist in yarn and with yarn costs. The following is an abstract or the table of contents:

Transmission of Motion, Cotton Mixing, Opening and Scutching, Carding; Preparation for, and Combing; Attenuating and Equalizing (The Drawing Process), Attenuating (The Fly-Frame Processes), Specification of Conditions in Carding Department, Spinning, Yarns, Doubling, Costs of Yarn.

A Technical Cyclopedia (Lexikon der Gesamten Technik); by Otto Lueger and associates; Deutsche Verlags-Anstalt, Stuttgart and Leipzig, Germany; complete in 40 parts; price, $100.

We have received Parts 26, 27 and 28 of this valuable work. The present issue is the second edition and has been revised and brought up to date to meet the advance in all the different departments of technical work. The editor, Herr Lueger, has a large number of specialists to assist in the work, each article being signed by the writer. The text is in German.

Business Literature.

Magic Boiler Compound; H. W. Johns-Manville Co., 100 William Street, New York, N. Y.

A pamphlet describing the advantages of Magic Boiler Compound, for which they are the distributing agents.

Howard Grease; Olney & Warrin, 66 Centre Street, New York.

A new pamphlet describing Howard Grease manufactured as a lubricant for shaftings and bearings. It is especially designed for lubrication where it is desired to overcome oil drippings and constant lubrication without frequent attention.

Ruberoid Pete; The Standard Paint Co., New York.

This is pamphlet which illustrates the uses and qualities of Ruberoid Roofing. The bright copy and excellent colored illustrations tempt the reader to turn page after page, and when the end is reached then still is the desire for more. Considerable originality was used in its preparation. A copy of "Ruberoid Pete" to anyone interested in roofing materials by The Standard Paint Co., 100 William St., New York.

National Association of Woolen and Worsted Overseers.

The following notice regarding the semi-annual meeting is sent out from the office of the Secretary:

"The twenty-fifth semi-annual meeting of the N. A. of W. & W. O. will be held at Boyden Heights, Providence, on Saturday, May 16, at 10.30 a. m. sharp. Business: Election of members proposed at the annual meeting; and report of the committee to confer with C. H. Morse, Secretary of the Mass. Commission on Industrial Education, on co-operation: also with W. H. Dooley of Lawrence, Mass.; and other business that may come before the meeting; nomination of officers will take place at this meeting.

"The Foreman Dyers' Mutual Improvement Association Club, 28 North Main St., will be open, as usual, and brothers are invited to call; a hearty welcome is assured.

"The committee in charge requests that every member intending being present to return the attached postal not later than the 9th, so that they can make arrangements for the banquet.

"Banquet at one o'clock sharp.

"The 1908 Manual will be at this meeting for distribution."

James McDowell, President.
Walter Pickford, Secretary.

Useful Information for Cotton Manufacturers.

Stuart W. Cramer of Charlotte has recently published a valuable set of reference books for cotton manufacturers. These books are not to be confounded with the average catalogue or business literature. They are very much more than that. While published frankly for the purpose of giving information about many different lines of machinery represented by the author, these various lines are so extensive that they constitute a complete outfit for a modern cotton mill. Not only are all the different machines described, but the calculations and data about them, which any buyer or user wishes to know, are here to be found conveniently and systematically arranged. These books also serve as a direct aid and help to those who are contemplating going into the cotton mill business. Most of the questions which are likely to arise in this connection are answered in these volumes.

Volume I treats of textile manufacturing machinery, giving the different calculations, the output, range of work to which certain machines are adapted, etc.

Volume II treats of power plants, including steam, water, electric, gas, also power transmission by means of shafting and rope drives and electric transmission. Heating and ventilating are also treated in this volume and there is an elaborate section devoted to humidification and air conditioning.

Volume III treats of the dyeing and finishing departments and contains a great deal of valuable data about the practical and commercial sides of cotton manufacture. The section devoted to mill architecture is very valuable, embodying as it does the experience of the author who has designed and equipped many mills in the South. He has collated and here published a great deal of information that is not otherwise easily accessible. The layout and organization of mills is treated in this section with tables of estimates and many drawings and specifications taken from the actual plans of the author. A complete index makes the vast amount of information available for ready reference.

These three volumes are attractively printed and bound in flexible, full leather binding with gilt stamping. Few technical books are so handsomely or expensively published. They are not sold but were primarily published as a reference book for the author's business friends and customers in the cotton mill business in the South, and a set has been presented to every mill treasurer and agent in Southern states.

We understand that they are also being sent to Northern mill officials upon application. It is an opportunity which is well worth taking advantage of.

The Economy in Using Wood Preservatives.

The value of coal tar to the textile industry is not limited to its use for artificial organic dyestuffs, much as the wide exploitation of that use has obscured other phases of its usefulness. Coal tar is used to some extent, without treatment, for preserving wood from decay, as a protective paint and in forming furnace linings. But it is by the distillation of coal tar for the separation of the more important constituents that the best wood-preserving substances are obtained, just as the substances are derived for the manufacture of coal tar dyestuffs. And it is the use of these distillates or heavy coal tar oils as wood-preservatives that another important use has been found for the formerly useless by-product of illuminating gas manufacture. The accompanying "Family Tree" of coal tar illustrates to some extent the wide use of some of its component parts.

A graphic chart prepared by the U. S. Department of Agriculture shows that the price of lumber has risen from 67 to a little over 95 per cent. on different grades — or at an average on the various grades of about 84 per cent. — during the last dozen years. This means that lumber for floors, walls, dye-tubs, etc., has increased in value until $1840 must be paid for the amount of lumber that cost $1000 a little over ten years ago. Without considering the causes of the rise in lumber values or speculating as to the probable ups and downs in future prices, it is evident that preservation of the life of woodwork is a subject worth the effort of careful attention. Railroad corporations have found this out and use preservatives on bridge timbers, platforms, signal and telegraph poles, etc.; the large packers use preservatives in and around plants exposed to dampness, in such places as floors and sills; even lumber dealers find use for preservatives around their buildings, perhaps not so much to save the lumber as to save the labor and expense of repair work.

In textile manufacturing there are at least as many places where wood is put to uses which must inevitably reduce the capability of performing them as in other industries, and in addition

new problems peculiar to textile operations are presented. In dye-houses, wet-finishing rooms and other places where floors are exposed to alternate wet and dry conditions, as in the handling of dripping wet goods and the periods when the room is idle, woodwork rots out very quickly. In drying rooms where the upper timbers are exposed to variations of temperature, the steam condenses on the ceiling and the water formed on the wood in this way dries during the night time, making very favorable conditions for decay. In dye vats and in bleacheries, wood is subjected to acids and other reagents in addition to the alternate wet and dry conditions which hastens the destruc-

tion of the wood fibre. In this latter case it is necessary to select for use as a preservative a substance which will not be affected by acids and unite with the fabrics or other material.

The above are a few of the places where a preservative can be used with profit inside the buildings. On the outside of the buildings, on wood structures in the yard such as trestles, tanks, roofs, etc., and on all woodwork exposed to the elements or to the dead, damp air in dark unventilated places, a good preservative will add one hundred per cent. to the life of wood. One man with whom we recently communicated said it would add four or five hundred per cent.

While the statement that this form of economy has not gained the attention of textile men to a wide degree, is probably true, there are a number of manufacturers who are using wood-preservatives. In response to a recent inquiry, a Massachusetts cotton manufacturer stated: "We believe much expense and repair can be saved by using treated wood in places where conditions tend towards rotting," and advised further that he had just put in his bleachery some hard pine posts and beams which had previously been treated with heavy coal tar oils.

Readers of European textile papers will probably recall that this subject has been frequently discussed in such papers. The preservative probably used most widely by textile manufacturers in Europe, and for the matter of that, probably used by more consumers in all parts of the world, is a coal tar distillate invented by Dr. R. Avenarius and sold under the trade name of "Avenarius Carbolineum." This preservative is made in Germany where the art of utilizing all by-products of coal tar is much further advanced than in our own country. This Carbolineum has, however, also been on the American market since about 1885, and is represented by a firm in New York City.

This wood-preserving paint, for such it really is, is an impregnating oil of heavy specific gravity for which it is claimed that its chemical ingredients will effectually prevent rot, dry-rot and decay. Ample evidence which we have collected bears out the claims made for the material regarding its wood-preserving qualities regardless of the how, why or wherefore of its chemical constituents.

The manufacturers state that Avenarius Carbolineum is a chlorinated distillate of coal tar possessing antiseptic ingredients which neutralize the rot-producing elements or germs contained in the wood structure, while the fatty oils seal up the pores on the outside and effectively prevent other germs from entering the wood under any exposure. The substance is insoluble in water as also in benzene. Some exposure to light is necessary to develop the permanent color of Avenarius Carbolineum; then it appears as a brown stain of good wearing qualities. As the interior of a great number of mills is painted white in order to give more light, it might here be added that a white paint or whitewash may be applied over the treated surface very readily.

Of special interest to the textile trade is the simplicity with which this material can be applied, for no special skill or complicated machinery is needed. A common paint brush in the hands of an ordinary laborer is all that is required, or when a large job is on hand, the wood may be dipped into the liquid, which is perhaps the best way. The length of time which the wood is to be immersed varies according to the size as well as quality of the timber and the use to be made of it, the denser varieties of wood taking the treatment more slowly than the open grained varieties, such as short-leaf pine, loblolly, spruce, etc. The cost of treatment with this preservative varies in accordance with the treatment the wood receives from $5 to $8 per 1000 surface feet; about 50c. per square for shingle roofs; 2c. for fence-posts, 15c. for railroad ties, and 5 to 10c. for telephone pole butts, for material The simplicity of applying the Carbolineum compound and the

ability to always have same on hand for odd and end repair work has been a great factor in promoting its more general use.

We reprint below the view expressed by some of the mills, to whom thanks are due for the courteous manner in which our inquiries received attention.

Wayne Knitting Mills, Fort Wayne, Ind.

"We have used it for coating all wood, such as fence-posts, etc., that were covered with ground. We have also painted the beams, rafters and other woodwork exposed to steam in our dye house."

Richmond Hosiery Mills, Chattanooga, Tenn.

"It gives us pleasure to state that we have used Carbolineum on all timbers and floors in our cotton warehouse under which is situated a pool or reservoir for our sprinkler system. We have quite a number of condensing steam traps discharging into this pool which creates quite a good bit of moisture, but upon examining the timbers after having been in about three years we find absolutely no sign of rotting or deterioration. We applied the Carbolineum by means of a paint brush, giving three coats to all the wood, especially the ends of the timbers and into the grooves and into the splines."

The Glenside Woolen Mills, Skaneateles Falls, N. Y.

"We have applied the material to the interior of our new dye house walls, and although it has been on a little over a year, the woodwork in the room shows a good state of preservation. We have made use of it as well on the outdoor transmission trestles and between the joints in boards of soap vats, etc."

Ossipee Cotton Mills, Burlington, N. C.

"We have used the Carbolineum for a number of years on wooden tank towers, dye house vats, etc., and have found it to be all that is claimed for it. We recommend it to anyone who has to use a great deal of woodwork in exposed places, for it will certainly make wood under such conditions last from three to four times as long as it would otherwise."

J. Capps & Sons, Ltd., Jacksonville, Ills.

"We are satisfied that it is a great benefit to the lumber treated with it and that the life of the timber so treated will be very much prolonged. We find in outdoor work, such as platforms, that it keeps the wood from warping as well as from rotting."

Cheney Bros., South Manchester, Conn.

"Our use of the material has been confined to the treatment of a yellow pine coal trestle and some underground wooden boxes. We think it is a good thing to add to the life of timber."

The most conclusive test that has come to our knowledge is from the Cedarburg Woolen Mills, who in 1891 laid a floor in the basement of their mill where it is quite moist and the floor has no ventilation. They now write under date of April 18, 1908, that with the exception of a little repairing around the scouring and fulling mills, this floor is still in good condition. They also state that floors laid previous to 1891 in the same basement lasted only three years. Needless to say, this mill still uses Carbolineum, and a floor that will last 18 years under such conditions must certainly have been treated with a good wood preservative to give such service.

To the saving of lumber bills consequent upon the use of a wood preservative must be added the saving of labor for the renewals, and to all this must be added the avoidance of troubles and even shut-downs caused by premature decay of wood.

The Hyatt Roller Bearing.

We have received an illustrated catalogue describing the roller bearing manufactured by the Hyatt Roller Bearing Co., Newark, N. J. This bearing, which it is claimed effects a saving of 12 to 20 per cent. of the power transmitted, is manufactured in over 300 sizes, adapted to a wide range of speed and load. Among the textile mills using this bearing are the following: Thistle Mills Co., Ilchester, Md.; Rosemary Mfg. Co., Roanoke Rapids, N. C.; Virginia Woolen Mills, Winchester, Va.; H. C. Townsend Cotton Mills, Anderson, S. C.; Wm. E. Hooper & Sons Co., Baltimroe, Md.; Peterson Textile Co., Roanoke Rapids, N. C.; Weldon Cotton Mills, Weldon, N. C.; Lowell Cotton Mills, Lowell, N. C.; Riverside Mills, Augusta, Ga.; Ashland Mfg. Co., Dickeyville, Md.

Whitin Combers in England.

Arrangements have been made by which the Messrs. Howard & Bullough of Accrington, England, will manufacture cotton combers for the English and Continental trade under the patents of the Whitin Machine Works, of Whitinsville, Mass. G. M. Whitin, Treasurer of the Whitin Machine Works, has recently been in England and completed the negotiaions.

Announcement.

After March 24, 1908, our sales headquarters for the New England States and Eastern Canada will be established at 34 Oliver St., Boston, Mass., with a force of experienced contracting engineers under the management of our Mr. A. H. Sawyer.

The above change is made for the purpose of promoting more convenient and closer relations with our customers, and we sincerely solicit the continuance of your valued patronage through our Boston office. B. F. Sturtevant Co., Hyde Park, Mass.

Removal.

The executive offices of the Westinghouse Electric & Manufacturing Company, now at 111 Broadway, New York, N. Y., and the New York sales and export offices of that company now at 11 Pine St., will be removed on Monday, April 20, 1908, to the new City Investing Bldg., 165 Broadway, New York.

Ament's Iron Glue.

This is the invention of a practical coverer who realized the need of a thoroughly dependable glue for sticking leather and other substances to iron so that it would stay put until worn out. After ten years of experimenting he successfully solved this difficult problem, and in the last two years has given his glue severe working tests on different classes of work in the mills. The results have been so gratifying that he is now offering this iron glue to the trade with his guarantee that it is superior to any glue now in the market that he knows of for the same purpose.

Iron glue is put up in semi-solid form in cans from 1 lb. to 25 lbs. all ready for use when warmed, and is very simple to apply.

The manufacturer offers to send a sample demonstrating the glue to any interested parties.

W. E. Caldwell Co., of Louisville, large machine builders, state:

"We have found this glue better for our use than any we have ever before tried, particularly when used with leather and iron. We find that for covering pulleys with leather or paper it is the only glue that will hold. We have tried a great many different kinds for this purpose and this is the only glue that has been a success with us."

The Hope Worsted Mills Co., of Louisville, after two years' use, state:

"For covering iron pulleys, worsted drawing and spinning rolls and all iron surfaces to be covered with leather we have not found any glue on the market equal to yours."

Ventilating the Subways in New ork City.

Independent of the ventilating equipment for the New York subway, which was furnished by the American Blower Company of Detroit, a cooling plant has been installed at the Brooklyn Bridge Station of the subway, where four large "ABC" fans are employed. These big machines blow cool and refreshing air upon the vast crowds which collect at this point and naturally attract the grateful attention of the multitude to whose comfort they minister.

In the tunnel under the East River, from the battery to Brooklyn, fresh air is provided by means of "ABC" blowers, two of which are installed at each end of the tunnel, supplying air in the direction in which the trains operate.

The "ABC" blowers have also been adopted for the ventilation of the Hudson River Tunnels connecting New York and Jersey City, as well as for the ventilation of the Hudson Terminal Buildings.

Moving Plant.

The T. R. Almond Mfg. Company, which for a number of years has been located at Brooklyn, N. Y., has removed its manufacturing plant and main office to Ashburnham, Mass. They will maintain a New York office at 40 Murray St., at which place they will carry a well assorted stock of their specialties which include Almond Right Angle Countershaft, Drill Chucks, Turret Head Tool and the Almond Flexible Steel Tube for conveying oil or gas for electric and gas brackets.

The Business of Selling and Leasing Factories.

The problem of finding factories suitable for different classes of manufacturing industries has been one that has been a troublesome branch of the real estate business. A broker who is in a position to place before parties desiring factories a long list of properties in many different localities can be of much service to both buyer and seller.

It has only been within the last five or six years that this particular branch of the business has come into existence. It entails a great amount of data. It is absolutely essential before presenting factory properties to have everything that is connected with factories in such form that the interested parties are able to grasp the matter under consideration at once.

It is necessary to give the size of the ground; the kind of factory; whether frame or brick; the number of stories; number of square feet; height of ceilings; number of horse power for both engine and boiler; whether shipping facilities are easy of access, such as water front and railroad siding, and also whether the labor centre is dominated by union labor.

Being "factory specialists," J. Clifford Moore & Co., 273-77 Broadway, New York, are in position to offer such data at any time about factories suitable for any kind of industry that may be desired.

German Color Works for England.

The syndicate comprising the Elberfeld Farbenfabriken, the Badische Anilin und Soda Fabrik, and the Act.-Ges. fur Anilin-Fabrikation, have bought twenty-four acres of land, at a cost (it is rumored) of $140,000, on the borders of the Mersey, in Bromborough, near Port Sunlight, and facing the Liverpool Docks. The syndicate have also secured option to purchase other and still larger plots of land. It is proposed to erect works costing about $400,000, in which, under the name of the Mersey Chemical Works, Ltd., the English patented products of the three firms will be manufactured.

The signatories of the new company are all connected with the associated German firms, viz., S. Vischer, Ludwigshafen; R. Huttenmuller, Mannheim; Dr. E. R. Ehrhardt, Heidelberg; Dr. E. T. von Bottinger, Elberfeld; Dr. C. Duisberg, Elberfeld; Dr. K. Krekeler, Mulheim; and Dr. F. Oppenheim, Berlin.—Jour. Soc. Dyers and Colorists.

Sizing and Finishing.

Tangol is used extensively in Europe for sizing, finishing, weighing, dyeing, waterproofing and fireproofing. For all these different purposes it is used either alone or with other material commonly applied. There seem to be unlimited possibilities for this new discovery. The holders of the American rights are the Arabol Manufacturing Company, 100 William St., New York.

Installing Large Water Softening Plant.

The Wayne Knitting Mills, Fort Wayne, Ind., will install a Eureka water softening and purifying apparatus of 10,000 gallons hourly capacity. The treated water will be used for their various manufacturing processes and also for boiler feeding. Contract for this important improvement has been placed with the Dodge Manufacturing Company, of Mishawaka, Ind., maker of the Eureka apparatus.

Important New Agencies.

Edward Jefferson & Brothers, 127 South Second St., Philadelphia, Pa., have in addition to the agencies which they have held for some years, just been appointed sole agents for James Yates & Son, Ltd., Cleckheaton, England, makers of all classes of card clothing, also for Knowles & Co., Bradford, England, for all kinds of dyeing, finishing and bleaching, mercerizing and waterproofing, and other machines of a similar nature.

Also sole agents for P. & C. Garnett, Cleckheaton, England, for all classes of Garnett machines, rag pickers, knot breakers, Blamires feeds and cotton bat machinery.

Good Work in Mill Repairs.

It recently became necessary for the Neuse River Mills, Raleigh, N. C., to replace two 6-inch shafts, each 13 feet long, with one shaft of the same diameter 26 feet long in a horizontal water turbine. Mr. Fonville, the engineer at the mill, took full charge of the work and after careful planning finished the job without any assistance outside of the regular mill organization. The superintendent of the Neuse River Mills is Will Nelson, formerly of Lowell, Mass., who is well known to a large number of our readers.

Jacquard Weaving.

It is well known what an important part the cards play in jacquard weaving. The operation of preparing these cards consists of marking the design on the cards and then perforating them.

The operations are simple, but the variety of textures and combinations of different weaves make the process very complicated. Many efforts have been made to simplify the work of preparing the cards for the loom. Much progress in this direction has been made in France by Pierre Vial of Roubaix, who has effected the perforating of the cards by motive power. He informs us that his machines can turn out 40,000 cards and more than 100,000 duplicates per day. The braids and bands for connecting the cards are made on a large scale in his own workshop.

Changing Montreal Offices.

The former Montreal offices and warehouse of the Casella Color Co. having been taken for a government building, they have removed to 59 William Street, where the offices and facilities will be equally commodious and convenient.

The Trade-Mark "Eureka" for Press Boards.

For the past two years litigation has been in progress between E. W. Murphey & Co. of Hudson, N. Y., and Case Brothers, over the right to use the word "Eureka" as a trade-mark for press boards and press papers used by knitting and hosiery mills. The United States Patent Commissioner had previously decided that E. W. Murphey & Co. had the superior right to register this trade-mark and the Court of Appeal of the District of Columbia has now affirmed this right, and the trade-mark certificate of registration will be issued to them. The case involves some unusual points. The opinion of the court is of interest in view of the increased attention and value paid to the registration of trade-marks.

This is an interference proceeding between rival applicants for the registration of "Eureka" as a trade-mark for press boards. These boards are sheets of heavy paper card board used by knitting mills in pressing and finishing their goods. A book is made by placing the goods upon a board; another board is placed thereon, which is covered by goods again. This process goes on until a book of proper size is made up to go between the plates of the hot press, where pressure and heat are applied. Where there is a high degree of heat, an extra high grade of board is necessary.

Case Brothers were manufacturers of press boards in Connecticut. Murphey & Co. were engaged at Hudson, N. Y., as dealers in mill supplies, including press boards, and ordered their boards from Case Brothers. In many instances, the orders when received were followed by shipments directly to the consumer. The bills were sent to Murphey & Co., who paid them. The sales by Case Brothers were to them and not to their customers. Murphey & Co. claim to have requested the manufacture of a very high class board, to which they gave the name "Eureka." The name could not be affixed to the boards because the ink would come out in pressing and injure the pressed articles.

Murphey & Co. filed their application for registration April 18, 1906, and Case Brothers applied May 22, 1906. The examiner of interferences denied registration to each party on the ground that "Eureka" had been adopted and used as a mark of grade or quality.

On appeal by both parties to the Commissioner the latter held that Murphey & Co. were the first to use the mark and that it was not a grade mark merely, but a valid trade-mark.

As the mark could not be affixed to the goods themselves, there was some doubt as to a trade-mark use, but by reason of sample cards sent with packages by Murphey & Co., showing the name, the commissioner was of the opinion that the acts of Murphey & Co. amounted to a trade-mark use.

Whether the mark can be registered as a valid trade-mark, because of its character and use, is a question that is not before us on this appeal. Assuming, as found by the commissioner, that it may be registered by the one entitled to its use, the sole question is as to the rights of the respective claimants.

The evidence in support of the claims of the parties has been fully and fairly reviewed by the

commissioner, and, agreeing with his conclusion, we see no occasion for its discussion.

If the mark were used in such a way as to constitute it a trade-mark, we think that the commissioner was clearly right in holding that Murphey & Co. had the superior right to register it.

The decision will therefore be affirmed; and this decision will be certified to the Commissioner of Patents. It is so ordered. Affirmed.

The Franklin Institute of Philadelphia.

This institution for the promotion and encouragement of manufactures and the mechanic and useful arts is about to erect an attractive building on the new parkway which extends from the city hall to Fairmount Park; the location being where the parkway intersects 16th and Arch Streets.

The first exhibition of American manufactures in the United States was held under the auspices of the Franklin Institute in the year 1824 in old Carpenters Hall in Philadelphia and since that notable event the Institute has held over twenty-nine exhibitions.

The membership of the Institute is not confined to the City of Philadelphia. The membership is divided into two classes: — one, the resident membership and the other the non-resident membership. The non-resident members will be found in almost every city of the United States, so that the Franklin Institute while primarily a Philadelphia institution is, in fact, a national organization, and if the plans of the present managers are carried out its sphere of usefulness will be greatly enlarged owing to increased facilities, as the new building will be one of the finest and best equipped of its kind in the country, if not in the world.

THE NEW BUILDING FOR THE FRANKLIN INSTITUTE.

The building will be isolated so that an abundance of light can be secured, and, as planned, will include a large auditorium and a small hall on the first floor, besides the offices, laboratories, and exhibition rooms in the basement. The museum and committee rooms will be situated on the second floor and the third floor will be occupied by the schools of the Institute, which include mechanical, free hand and architectural drawing, machine design and naval architecture. The extensive technical library will occupy the entire fourth floor. The reading room and reference library will be directly under the dome. The stack room will be at either side of the building and space will be provided for smoking and conversation rooms.

The building will be so designed that conventions of manufactures and meetings of scientific bodies can be held in the main auditorium, exhibition hall and commitee rooms, without interfering with the ordinary use of the building.

Laboratories will be provided for experimental work, and a course of lectures by eminent professors will be arranged for men who have not had an opportunity to secure a college or university education in their early days. It is also proposed to hold post graduate courses of lectures on scientific subjects.

Changing New York Office.

The New York office of the Crocker-Wheeler Company has been moved across the street to 32 Cortlandt St., Cortlandt Bldg., Hudson Terminal. This 22-story building, the largest in the city, is the machinery headquarters of New York.

The new location is of special convenience to our customers and to the Crocker-Wheeler Company, as it brings our New York office into closer touch than ever with the works and main office at Ampere, N. J.

Notice for Hose Houses.

The Eureka Fire Hose Mfg. Co., New York, have issued a very useful poster for hose houses giving the following directions for the care of hose:

"Do not allow hose to remain in wagons, or on reels, if wet or muddy; remove all mud by washing or brushing, and expose hose to air, in towers or on racks, preferably at full length, to dry.

"Our hose is antiseptically treated, and will not mildew or rot if given ordinary fire department care, but continued dampness is injurious to cotton fabrics. Mud often contains metallic or other substances that are chemically injurious to hose, if permitted to remain on it.

"Do not permit hose to remain on apparatus for any great length of time when not used. It should be removed, hung up on towers or on racks, and replaced with a fresh supply. Avoid short bends in hose that is stored away. When necessary to store hose in folds, the folds should be changed occasionally, to overcome permanent set of hose.

"When new hose is received do not allow it to remain packed in cases until it may be required, but remove from cases and loosen coils.

"Unless hose is likely to encounter a freezing temperature, it is not necessary to drain the water our completely, as the rubber lining is not injured by dampness within, but on the contrary is benefited by remaining in a moist condition, and all rubber lined hose should have water passed through it at frequent intervals to moisten the rubber.

"Hose when frozen is liable to crack, if bent while in that condition. Extreme cold causes a deterioration of rubber, but not sufficient to prevent storage of hose in cold storehouses, if thoroughly drained and dried.

"Avoid exposure of hose to very hot, dry air. It should not be stored where exposed to the sun's rays. When hose must be kept in hot and dry places, it is best to pass water through it monthly.

"When fire hose is being used see that section nearest engine or hydrant is not being chafed at point of contact with the ground, by vibration.

"Acids and other chemicals, oils, iron-rust, etc., fumes arising from some processes, are injurious to hose and contact with them is to be avoided.

"When discharging or recharging chemical engines or extinguishers, see that solutions used do not come in contact with hose."

The poster is 12 1/2 by 18 1/2 inches. The notice is printed in large type. A copy should be in every hose house.

Announcement.

Hungerford & Terry, filtration engineers, Pennsylvania Bldg., 15th and Chestnut Sts., Philadelphia, announce that they have arranged with Mr. B. M. Westerman of 140 Nassau St., New York City, for the sale of their filters and water purifying apparatus in the territory contiguous to New York City. Messrs. Hungerford & Terry are manufacturing the well known "Hungerford" filters, examples of which are found in many of the most prominent textile mills in the United States. They also announce that inquiries concerning the use of water in textile operations will be cheerfully answered and analyses will be made and plans and recmommendations will be submitted, etc., without charge.

Stafford and Holt Win the "Pine-apple Stitch" Infringement Case.

The United States Circuit Court has rendered the decision in the case of Stafford & Holt, Little Falls, N. Y., against A. V. Morris & Sons of Amsterdam, for the use of the patented machine by which a so-called pine-apple stitch is produced, the plaintiff claiming that the machine infringed their patents. The machines used by Morris & Sons were built by H. P. Snyder & Co., Little Falls, N. Y., who defended the suit. The patent has nine claims, six of which are in issue. The patentees declared that the particular purpose of the invention is a circular ribbed knitting machine in which certain of the needles of one set can be made to knit plain, others to knit a tuck-stitch, and some to skip the thread delivered from the same feed to such needles successively by means of which operations any number of such stitches may be produced at the same point and the stitch changed from one to another kind or form at any point of the operation.

The judge says: "It is conceded that the various elements of the complainants' device are old, but it is insisted that this is a new combination, with novel features, producing both a new result and some old results in a new and far better way. The prominent new feature consists in the independent operation of the various swinging throat-cams at the right instant and at the right point for producing the pine-apple stitch. The old machine produced by the defendant will not do the work that the Stafford & Holt machine will, and this is evidence of a material and substantial difference. I have examined the patents and machines in their actual practical operation, and have arrived at the conclusion that the patent discloses patentable invention. I think the defendant's machine has substantially all the elements of the patent in suit arranged in the same way to produce the same result. Infringement cannot be avoided by mere changes in form. The 'soul' of the patent is found elsewhere. An examination leads me to the conclusion that there is infringement." There will be a finding for the complainant accordingly and for an accounting with costs.

Instructors Remembered.

At the close of the term the members of the 1908 evening design class of the New Bedford Textile School presented Samuel Holt, head instructor, with a leather suit case. Charles Buckley, assistant instructor, was presented with a fountain pen. Christopher Cheetham made the presentation on behalf of the class and Messrs. Holt and Buckley responded suitably.

The names of the graduates follow: Walter Sterling, Philip Holmes, John Ashley, John Ashworth, Fred Brown, Thomas Rawcliffe, Fred Holt, Emanuel Ormerod, Christopher Cheetham.

A Finishing Material.

Tangol dissolved in water, without any additions will, it is claimed, give a beautiful finish to high grade fabrics, especially woolens and silks. Among the other claims are that it makes a good back finish for plush, velvets and velveteens, corduroys, etc., and that, without admixture, it may be used where a light finish is desired for high grade cotton goods, such as printed satin, etc., sateens for lining, white or colored fabrics like zephyrs for shirts, etc. For a heavy finish it gives satisfactory results if used with epsom salts. Tangol is sold by the Arabol Manufacturing Company, 100 William Street, New York.

An Echo of the Atlanta Cotton Conference.

From a speech by the Hon J. Thomas Heflin of Alabama in the Congressional Record for March 18.

Mr. Speaker: The attention of the world is turned to the South when in the spring of the year the farmer prepares his soil and places seed in the ground. Sunbeams dance on the surface, refreshing showers seek and find their hiding place, and lo! germination begins. Little plants push the clods away and smile at the sun. Gentle zephyrs kiss their tender faces and breathe into them the message of their world mission. (Applause.) We hear the music of the hoe and the song of the happy ploughman. Proud and graceful the little stalks stand mantled in leaves and ladened with squares. We look again and thousands of white blossoms are nodding welcome to the gold belted bees. In a little while they are rosy red, then they assume a golden hue, and finally fade and fall, leaving behind them tiny green spheres. Basking in sunshine and reveling in shower, these flourish until autumn winds whisper to every full grown boll, "Open sesame." (Applause.) Then the cotton stalk flings its fleecy fiber to the breeze and busy fingers pluck it from the boll. Now we hear the hum of the old cotton gin, the seeds fall down on the floor below and lint comes out in swirls of snow. (Great applause.) Yonder at the cotton factory, hard by the cotton field, we hear the tremulous voice of industry in the concert of whirling spindles wooing the fiber into cloth, and the finished product goes out upon the pulsating tide of a splendid commerce and cotton is King—King of American exports—and in all its ramifications is basis for the greatest manufacturing interest in the world. (Prolonged cheers and applause.)

New Boston Office.

William H. Grundy & Co., manufacturers of worsted yarns and tops, whose main office is in Philadelphia, have opened an office in Boston at 176 Federal St., in the Weld Bldg.

American Machinery for Scotland.

The Oswald Lever Co. of Philadelphia has been very busy for the last few weeks in filling orders for their latest cop winding machinery for Scotland.

The Value of a Textile Mill as a Going Concern.

Under this subtitle in a paper on "The Valuation of Textile Manufacturing Property," Mr. Charles T. Main, mill engineer of Boston, says: "There is a special value attached to a mill which is running and in which the purchaser might immediately commence work. There is considerable expense incurred in starting up a mill which is idle, and a large amount of expense in building, equipping, and organizing a new mill, which is not fully realized until paid for. The purchaser is able to begin immediately to manufacture and to realize a profit in good time. All of these things are in favor of an existing plant. There is also the advantage of investing less capital at the start, and if the arrangement and organization is such as may be improved and modernized, these improvements can be paid for out of the earnings instead of from the capital. On the other hand, if the capital can be obtained, it may be wise to be liberal in its expenditure and to begin as quickly as possible to reap the full benefit of the new and up-to-date plant.

"A concern which is doing a good business and has an established reputation for making desirable goods, whose trade marks and tickets give the goods an advantage over others not so well known, has an additional value above that of its material value which must be considered. This advantage may be only transient, and will exist only so long as people can be made to believe that these goods are better than others.

"If the valuation of the plant has been very conservative on the books of the company, and the depreciation has been liberal, it is probable that the actual value of the plant is more than that shown on the books, and a re-valuation at the time of sale may be very desirable."

George Otis Draper.

At the last meeting of the Board of Directors of the Draper Co., Hopedale, Mass., the following resolutions were unanimously adopted:

"Mr. George Otis Draper, who has been associtary of the company since its formation, having resigned because of ill health, we desire to place on record this statement of our regret because of his resignation and of our appreciation of his services.

"He has been an important factor in our success: an able adviser; an efficient executive, and uniformly courteous in his dealings. We feel that we have sustained a distinct loss through his resignation."

Mr. George Otis Draper has had charge of the advertising and literary products of our company, and its predecessors, since his connection with the firm of George Draper & Sons, in 1889. He has also served as a member of important committees during this period, and has given special attention to matters pertaining to patents.—Cotton Chats.

Recent Textile Patents.

CLOTH AND THE LIKE. Automatic Machine for Folding. 883,687. Albert Bendien, Almelo, Netherlands.

CLOTH. Machine for Extracting Fluid from. 883,536. Ernst Gessner, Aue, Germany.

CLOTH WINDING Machine. 883,690. Edward W. Blythe, Decatur, Tex.

COTTON CLEANER. 883,349. Alphones Rouquier, Natchitoches, La.

KNITTING- MACHINE Take-up Device. Circular. 883,958. Harry A. Houseman, Philadelphia, Pa.

LOOM. 882,922. Henry Bardsley, Providence, R. I., assignor to Crompton & Knowles Loom Works, Worcester, Mass.

LOOM TAKE-UP Mechanism. 882,904. Wm. J. Lutton, Paterson, N. J., assignor to Crompton & Knowles Loom Works, Worcester, Mass.

LOOM TEMPLE. 882,827. Calvin L. Joy, Lowell, Mass., assignor to Draper Company, Hopedale, Mass.

LOOM. Hair Fabric. 883,810. Bruno Knittel, Dresden, Germany.

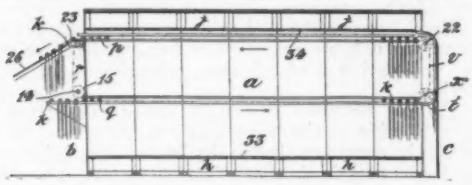
LOOMS FOR WEAVING. Dobby for. 883,975. Heinrich Schwarzenbach and Gottlieb Lier, Langnau, Switzerland.

LOOM. Weft Replenishing. 879,368. Randolph Crompton, Worcester, Mass., assignor by mesne assignments to Crompton & Knowles Loom Works, Worcester, Mass.

SEAM-PRESSING Machine. Garment. 879,479. Hjalmar Lindestrom, Chicago, Ill., assignor of one-half to Richard Tennerstedt, Chicago, Ill.

MACHINE FOR DRYING Yarn and Textile Goods. 881,602. Arthur Norrison Marr, Thorner, near Leeds, England.

In this machine the poles are arranged to be traversed longitudinally through the drying chamber, their ends being supported by races fixed to the sides of the drying chamber, and the poles are caused to be either continuously or intermittently moved through the same by projections fixed upon endless chains. Provision is also made for raising the poles by projections fixed to vertical lifting chains for conveying them successively



to one or more races on a higher level and for finally returning them to the inlet end of the machine in proper order for being again traversed through the drying chamber. An additional fan is also provided for the definite purpose of exhausting the moisture in the drying chamber of the machine, and also for causing a slight movement of air into the machine from the room at the point where the operatives attending the machine stand.

SPINNING APPARATUS. Traverse Motion for Yarn. 882,793. Jonas Northrop, Hopedale, Mass., assignor to Draper Company, Hopedale, Mass.

SPINNING AND TWISTING Apparatus. Ring. 883,120. Thomas C. Powell, Boston, Mass.

SPINDLE. Silk Throwster. 884,126. Fred Bryant, Matteawan, N. Y.

TEXTILE INDUSTRY. Torrefying Apparatus for the. 882,691. Charles F. Kaisser, Lille, France.

THREAD GUIDE. 12,769. Isaac E. Palmer, Middletown, Conn.

YARN. Manufacturing. 882,866. John S. Butterworth, Wallingford, Pa., assignor of one-half to Benjamin C. Fox, Chester, Pa.

SPINNING MACHINES. Doffing Means for Ring. 880,014. Robert L. Cumnock, Anderson, S. C.

SPINNING or Twisting Frame. 879,642. Lewtis T. Houghton, Worcester, Mass.

SHUTTLE-BINDER. 880,602. August Tilch, Lewiston, Me.

WINDING MACHINE. 881,210. Simon W. Wardwell, Providence, R. I.

WINDING MACHINE REEL. 881,149. Carl W. Pilscheur, Barmen, Germany.

WINDING MACHINE. 881,211. Simon W. Wardwell, Providence, R. I.

WOOL. Mordanting. 879,553. Sigmund Kapff, Aix-la-Chapelle, Germany, assignor, by mesne assignments, to Nitritfabrik Aktiengesellschaft, Coepenick, Germany.

WOOL Washing Bowl. 879,196. Frederick G. Sargent, Westford, Mass., assignor to C. G. Sargent's Sons, Westford, Mass.

WOVEN Fabric. 879,736. Charles L. Christmann, Englewood, N. J.

Recent Textile Trade Marks.

"Dependon." Carpets, Rugs, Textile Mats, etc. John V. Farwell Co., Chicago, Ill.

"Y. W. C. A." Gaiters and Leggings of Textile Material, Boots, Shoes, etc. Sanderson & Roosa, Lincoln, Neb.

"T." Stockings. William F. Taubel, Riverside, N. J.

"No. 10." Dress Fabrics of Silk, Worsted, Cotton, etc. Sidney Blumenthal & Co., New York, N. Y.

"Merry Widow." Dresses, Dress Suits, etc. Adler & Ast, New York, N. Y.

"Orchid." Velvet Ribbons. Wm. Openhym & Sons, New York.

"Cast Iron." Hosiery. Louis P. Haight, Muskegon, Mich.

"Torpedo." Ribbons. Carson, Pirie, Scott & Co., Chicago, Ill.

"Alma." Woven Cotton Plaids. Neuss, Hesslein & Co., New York, N. Y.

C. E. RILEY COMPANY

65 Franklin Street, .. BOSTON, MASS.

COTTON AND COTTON GOODS YARNS

DIRECT IMPORTERS OF EGYPTIAN COTTON

COTTON WOOLEN WORSTED MACHINERY

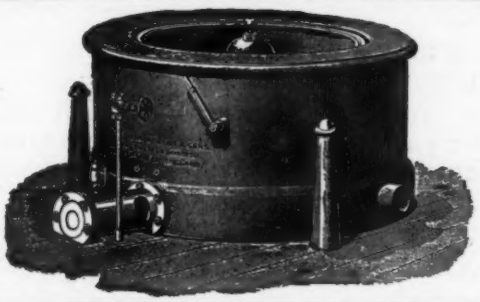
Thomas Broadbent & Sons,

Huddersfield, Eng.

PATENT DIRECT STEAM DRIVEN

HYDRO-EXTRACTORS

OVER 3500 IN USE. ALSO ELECTRICALLY DRIVEN



SUSPENDED ON LINKS. REQUIRING NO EXPENSIVE FOUNDATIONS

C. E. RILEY COMPANY, Sole Agents 65 Franklin St., Boston, Mass.

Machines Kept in Stock in Boston

Friction Load

You know the friction load of a mill, the power to turn belts and shafting alone, is high, from 20-50 per cent. of your total load.

Half of this is from tight belts.

Cling-Surface permits every belt to be run easy and carry fullest loads and turns this half from overcoming friction to doing work.

Besides preserving the belts, saving oil, labor and fuel, and giving steady, even speed at machines.

It is a belt food — not a sticky dressing.

A trial order will prove it. Send for one.

Cling-Surface Co

199-205 Virginia Street Buffalo N Y

Boston: 170 Summer Street | New York: 39 Cortlandt Street | Philadelphia: The Bourse

D and M GUM

Gives a permanently increased brilliancy to yarn and fabric.

Penetrates and swells the yarn, thus ensuring a perfect "cover" and face.

Is a transparent neutral gum which greatly increases the yarn's strength, lays the surface fibres and prevents waste and chafing in the loom.

Write for particulars.

Danker & Marston, Boston.

Buyers' Index

The addresses of builders of mill machinery and dealers in mill supplies, whose names appear in the following classified index, may be found upon referring to their advertisements. The Alphabetical Index to advertisers follows this classified list. Buyers who are unable to find in the classification here given such machinery or supplies as they desire, are invited to communicate with the publishers, who can, in all probability, refer them to proper sources. Advertisers whose names do not appear under desired headings will please notify the publishers. Such omissions are accidental, not intentional.

Accounts Financed.
Cathrall, W. M.

Air Moistening System.
American Moistening Co.
Buffalo Forge Co.

Architects and Mill Engineers.
Ferguson, John W.

Asphalt Floors.
Simpson Bros. Corporation.

Asphalt Tanks.
Scaife, W. B., & Sons.

Automatic Feeds for Cotton and Wool.
American Drying Machinery Co.
Kitson Machine Co.
Leigh, Evan A.
Philadelphia Drying Machinery Co.
Philadelphia Textile Machinery Co.
Schofield, Wm., Co.
Woonsocket Machine & Press Co.

Automatic Warp Drawing Machines.
American Warp Drawing Machine Co.

Bale Ties.
Acme Steel Goods Co.
DeHaven Manufacturing Co.

Baling Presses.
Minnich Machine Works.
Sullivan Machinery Co.

Bandings.
——See under Yarns.

Baskets.
Lane, W. T., & Bro.

Belting.
Boston Belting Co.
Burnham, E. E., Co.
Candy Belting Co.
Shultz Belting Co.
——See also Mill Supplies.

Belt Dressing.
Cling Surface Mfg. Co.
Dixon, Jas., Crucible Co.
Shultz Belting Co.
Stephenson Mfg. Co.

Belt Lacing Machines.
Birdsboro Steel Foundry & Machine Co.

Bias Machines.
Adams, A. L.

Bindings.
——See Tapes and Braids.

Bleaching Kiers.
Arlington Mch. Wks. (Arthur Birch, prop.)
Philadelphia Drying Machinery Co.
Textile Finishing Machinery Co.

Bleaching Materials.
Bosson & Lane.
Danker & Marston.
Roessler & Hasslacher Chemical Co.

Blowers and Blower Systems.
American Blower Co.
Buffalo Forge Co.
Dean Bros. Steam Pump Works.
Mass. Fan Co.
Philadelphia Drying Machinery Co.
Sturtevant, B. F., Co.
Schnitzler, Chas. H.

Bobbins, Spools, Shuttles, Etc.
American Supply Co.
American Textile Specialty Mchy. Co.
Cell Drier Machine Co.
Leigh, Evan A.
Lestershire Spool & Bobbin Co.
Rhode Island Fiber Spool Co.
Tebbets, E. L., & Co.
Wilson & Co.

Bobbin Winders.
Universal Winding Co.

Boiler Inspection and Insurance.
——See Steam Boiler Insurance.

Boilers.
——See Steam Boilers.

Boxes, Cloth Boards, Etc.
Pearson, J. T.

Box Strapping.
Acme Steel Goods Co.
De Haven Mfg. Co.

Braiding Machinery.
New England Butt Co.
Textile Machine Works.

Braids.
——See Tapes, Braids and Edgings.

Brass Hinges.
Root, C. J., Co.

Brazing.
American Ferrofix Brazing Co.

Bridges.
Scaife, W. B., & Sons.

Brushers.
——See Napping Machines.

Brushes.
Felton, S. A., & Son Co.
Mason Brush Works.

Burr Pickers.
Curtis & Marble Machine Co.
Sargent's, C. G., Sons.
Smith & Furbush Machine Co.

Calico Printers' Machinery and Supplies.
Arlington Mch. Wks. (Arthur Birch, prop.)
Birch Bros., Somerville Machine Wks.
Buhlmann, A. W.
Butterworth, H. W., & Sons Co.
Taunton-New Bedford Copper Co.
Textile Finishing Mchy. Co.
——See also Dyeing, Bleaching, Machinery, etc.

Canvas Baskets.
Lane, W. T., & Bro.

Caps.
Calder Machine Works.

Carbonizing Machinery.
Birch Bros., Somerville Machine Wks.
Philadelphia Drying Machinery Co.
Philadelphia Textile Machinery Co.
Sargent's, C. G., Sons.
Tolhurst Machine Works.

Card Clothing.
Ashworth Bros.
Leigh, Evan A.
Riley, C. E., Company.
Stoddard, Haserick, Richards & Co.

Card Cutting.
Vial, Pierre.

Carded Cotton.
Blaisdell, S., Jr., Company.

Card Feeds.
——See Automatic Feeds.

Card Grinding Machinery.
Entwistle, T. C., Co.
Leigh, Evan A.
Riley, C. E., Company.
Smith & Furbush Machine Co.
Stoddard, Haserick, Richards & Co.

Carders' Tools.
Brown, Wm. H., Co.

Carpet Machinery.
Altemus, Jacob K.
Curtis & Marble Machine Co.
Philadelphia Textile Machinery Co.
Smith & Furbush Machine Co.

Casting Repairs.
American Ferrofix Brazing Co.

Castings.
Farrel Foundry and Machine Co.
Schofield, Wm., Co.

Cell Driers.
Cell Drier Machine Co.

Cement Pans.
Scaife, W. B., & Sons.

Chemicals.
Harding & Fancourt.
Roessler & Hasslacher Chemical Co.

Chemists.
Little, Arthur D.

Cling Surface.
Cling Surface Mfg. Co.

Clocks.
Pettes & Randall Co.

Cloth Boards.
Chaffee Bros.
Pearson, J. T.
Richardson Brothers.

Cloth Cutting Machinery.
Cameron Machine Co.

Cloth Stretchers.
Arlington Mch. Wks. (Arthur Birch, prop.)
Leyland, Thomas, & Co.
Textile Finishing Machinery Co.

Clutches.
American Tool & Machine Co.
Hunter, James, Machine Co.

Combs (Wool and Cotton).
Hood, R. H.
Jefferson, Edward & Brother.
Leigh, Evan A.
Philadelphia Textile Machinery Co.
Riley, C. E., Company.
Stewart & Sons.
Stoddard, Haserick, Richards & Co.

Concrete Work and Construction.
Gilbreth, Frank B.
Simpson Bros. Corporation.

Condensers.
Dean Bros. Steam Pump Works.

Conditioning of Textile Fabrics.
New York Silk Conditioning Works.

Consulting Electrical Engineer.
Puffer, William L.

Conveying Systems.
Buffalo Forge Co.
Sturtevant, B. F., Co.

Cop Spindles.
American Textile Specialty Mchy. Co.

Cop Tubes.
American Textile Specialty Mchy. Co.
——See Paper Tubes.

Copper Print Rollers.
Taunton-New Bedford Copper Co.

Coppersmiths.
Badger, E. B., & Sons Co.

Copper Work for Dyers.
Butterworth, H. W., & Sons Co.
Textile Finishing Machinery Co.

Cork Inserts.
National Brake & Clutch Co.

Corrugated Iron and Steel.
Scaife, W. B., & Sons.

Cost and Accounting Systems.
Wright, R. A.

Alphabetical Advertising Index, with page numbers, follows this list.

Cost Systems Devised.
American Cost Accounting Co.

Cotton.
Blaisdell, S., Jr., Co.
Charles, W. B.
Riley, C. E., Company.
Schwartz, L. H. A., & Co.
Stoddard, Haserick, Richards Co.
Tolar & Hart.

Cotton Machinery.
Altemus, Jacob K.
American Textile Appliances Co.
American Textile Specialty Mchy. Co.
Ashworth Bros.
Brockway & Meckenstrum.
Buhlmann, A. W.
Butterworth, H. W., & Sons Co.
Cramer, Stuart W.
Crompton & Knowles Loom Works.
Curtis & Marble Machine Co.
Draper Company.
Easton-Burnham Co.
Elliott & Hall.
Entwistle, T. C., Co.
Firth, William, Co.
Hetherington, John, & Sons, Ltd.
Howard & Bullough American Mach. Co.
Kilburn, Lincoln & Co.
Kip-Armstrong Co.
Kitson Machine Co.
Leigh, Evan A.
Lowell Machine Shop.
Mason Machine Works.
Metallic Drawing Roll Co., The.
Philadelphia Drying Machinery Co.
Philadelphia Textile Machinery Co.
Providence Machine Co.
Riley, C. E., Company.
Saco & Pettee Machine Shops.
Schofield, Geo. L.
Schwartz, L. H. A., & Co.
Smith & Furbush Machine Co.
Stafford, G. W., Mfg. Co.
Stoddard, Haserick, Richards & Co.
Textile Finishing Machinery Co.
Textile Machinery Co.
Whitin Machine Works.
Woonsocket Machine & Press Co.

Cotton Openers and Lappers.
Howard & Bullough American Mach. Co.
Kitson Machine Co.
Leigh, Evan A.
Riley, C. E., Company.
Stoddard, Haserick, Richards & Co.

Cotton Softeners.
Bosson & Lane.
Burckhardt & Co.
Danker & Marston.
Harding & Fancourt.
Nicetown Mfg. Co.

Cotton Waste.
Blaisdell, S., Jr., Co.
Charles, W. B.
Schofield, Edwin F.

Crayons.
Dixon, Jos., Crucible Co.
Howe Mill Crayon Co.
Lowell Crayon Co.

Cutting Machines.
Adams, A. L.
Cameron Machine Co.

Cylinder Oil (Superheated Steam).
Power Specialty Co.

Dextrine.
Stein, Hirsh & Co.

Dobbies.
Crompton & Knowles Loom Works.
Kilburn, Lincoln & Co.
Stafford, G. W., Mfg. Co.

Dobby Chain.
Nuttall, George.

Draughtsmen.
Cameron Machine Co.

Drawing Rolls.
Hood, R. H.
Jefferson, Edward & Brother.
Metallic Drawing Roll Co., The.

Drying Machinery.
American Blower Co.
Arlington Mch. Wks. (Arthur Birch, prop.)
Birch, Arthur, Arlington Mch. Wks.
Birch Bros., Somerville Machine Wks.
Buffalo Forge Co.
Butterworth, H. W., & Sons Co.
Cell Drier Machine Co.
Hunter, Jas., Machine Co.
Jefferson, Edward & Brother.
Kenyon, D. R., & Son.
Mass. Fan Co.
Philadelphia Drying Machinery Co.
Sargent's, C. G., Sons.
Schwartz, L. H. A., & Co.
Sturtevant, B. F., Co.
Textile Finishing Machinery Co.
Tolhurst Machine Works.

Drying Boards.
Bull, William C.
Pearson, J. T.

Dusters.
——See Wool and Waste Dusters.

Dust Collectors.
Philadelphia Drying Machinery Co.
Sturtevant, B. F., Co.

Dyers, Bleachers and Finishers.
Brophy's, T., Sons.
Davidson, J. F.
Davis & Quick.
Firth & Foster Co.
Germania Dye Works.
Globe Dye Works Co.
Home Bleach & Dye Works.
Lorimer's, The Wm. H., & Sons Co.
Pawtucket Dyeing & Bleaching Co.
Peerless Co.
Rowland, Samuel.
Solway Dyeing & Textile Co.
Utica Willowvale Bleaching Co.
Western Thread & Dye Works.

Dyeing, Drying, Bleaching and Finishing Machinery.
Alien, William, Sons Co.
American Blower Co.
Arlington Mch. Wks. (Arthur Birch, prop.)
Birch, Arthur, Arlington Mch. Wks.
Birch Bros., Somerville Machine Wks.
Buffalo Forge Co.
Buhlmann, A. W.
Butterworth, H. W., & Sons Co.
Cell Drier Machine Co.
Curtis & Marble Machine Co.
Entwistle, T. C., Co.
Gessner, David.
Heathcote, John, & Son.
Hopkins Machine Works.
Hunter, James, Machine Co.
Kenyon, D. R., & Son.
Klauder-Weldon Dyeing Machine Co.
Klipstein, A., & Co.
Leigh, Evan A.
Leyland, Thos., & Co.
Philadelphia Drying Machinery Co.
Philadelphia Textile Machinery Co.
Schwartz, L. H. A., & Co.
Smith, Drum & Co.
Sturtevant, B. F., Co. (Drying).
Textile Finishing Machinery Co.
Tolhurst Machine Works.
Vacuum Dyeing Machine Co.

Dye House Cans.
Hill, James, Mfg. Co.

Dye House Floors.
Simpson Bros. Corporation.

Dye House Trucks.
Bailey, Frank.

Dye Sticks.
Bailey, Frank.
Haedrich, E. M.

Dye Tubs.
——See Tanks, Tubs and Vats.

Dyestuffs and Chemicals.
American Dyewood Co.
Atteaux, F. E., & Co.
Badische Co.
Berlin Aniline Works.
Bischoff & Co.
Bosson & Lane.
Cassella Color Co.
Chemische Aniline Works.
Danker & Marston.
Kalle & Co.
Ford, J. B., Co.
Geisenheimer & Co.
Johnson, Chas. A., & Co.
Klipstein, A., & Co.
Leyland, Thos., & Co.
Metz, H. A., & Co.
Roessler & Hasslacher Chemical Co.
Sykes, Walter F., & Co.
Thayer, Ed. M., & Co.

Dynamos.
——See Electric Lighting.

Edgings.
——See Tapes, Braids and Edgings.

Electrical Construction.
Crocker-Wheeler Co.
General Electric Co.
Sturtevant, B. F., Company.
Westinghouse Electric & Mfg. Co.

Electrical Engineer (Consulting.)
Puffer, William L.

Electrical Heating Devices.
Crocker-Wheeler Co.

Electrical Supplies.
Pettingell-Andrews Co.

Electric Driven Pumps.
Dean Bros. Steam Pump Works.

Electric Fans.
American Blower Co.
Buffalo Forge Co.
Crocker-Wheeler Co.
General Electric Co.
Mass. Fan Co.
Philadelphia Drying Machinery Co.
Philadelphia Textile Machinery Co.
Sturtevant, B. F., Co.
Westinghouse Electric & Mfg. Co.

Electric Hoists.
Crocker-Wheeler Co.

Electric Lamps.
Pettingell-Andrews Co.

Electric Lighting.
Buffalo Forge Co.
Crocker-Wheeler Co.
General Electric Co.
Sturtevant, B. F., Co.
Westinghouse Electric & Mfg. Co.

Electric Motors.
——See Motors (Electric).

Elevators.
Salem Elevator Works.

Embossing Machines.
Cameron Machine Co.

Employees' Time Recorders.
Pettes & Randall Co.

Engine Repairs.
Fishkill Landing Machine Co.

Exhaust Heads.
Buffalo Forge Co.
Sturtevant, B. F., Co.

Expansion Joints.
Power Specialty Co.

Factories (For Sale and To Lease).
Moore, J. Clifford, & Co.

Fans—Exhaust and Ventilating.
——See Ventilating Apparatus.

Feed Water Heaters.
Scaife, W. B., & Sons.

Feed Water Pumps.
Dean Bros. Steam Pump Works.
Goulds Mfg. Co.

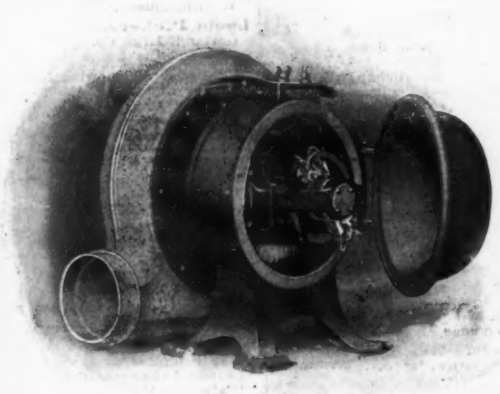
Feed Water Purifiers.
American Water Softener Co.
Dodge Mfg. Co.
Philadelphia Water Purification Co.
Scaife, W. B., & Sons.

Alphabetical Advertising Index, with page numbers, follows this list.

FOR LOCAL VENTILATION

An Electric Fan that can be carried about by a man

Particularly adapted for ventilating and
for blowing dust out of machines



Also made in larger size to deliver 425 cubic feet of air, requiring less than one-half horse power.

Weighs but 75 pounds.

Can be made to discharge in any direction.

Outlet 2¾ inches diameter.

Delivers 180 cubic feet of air per minute.

Requires but 300 Watts.

Ball bearings.

Send for Bulletin No. 97

B. F. STURTEVANT CO., BOSTON, MASS.

General Office and Works, Hyde Park, Mass.

NEW YORK PHILADELPHIA CHICAGO CINCINNATI LONDON

Designers and Builders of Heating, Ventilating, Drying and Mechanical Draft Apparatus; Fan Blowers and Exhausters; Rotary Blowers and Exhausters; Steam Engines, Steam Turbines, Electric Motors and Generating Sets; Pneumatic Separators, Fuel Economizers, Forges, Exhaust Heads, Steam Traps, etc. 652

Feeds.
—See Automatic Feeds.

Feed Water Regulators.
Berry Engineering Co.

Felt Hardeners.
Farrel Foundry and Machine Co.

Felting Machinery.
Farrel Foundry and Machine Co.

Fibre Spools.
Cell Drier Machine Co.
Rhode Island Fibre Spool Co.

Filters.
American Water Softener Co.
Hungerford & Terry.
Norwood Engineering Co.
Phila. Water Purification Co., The.
Scaife, W. B., & Sons.

Finishing Machinery.
—See Dyeing, Drying, Bleaching and Finishing.

Fire Brick.
Borgner, Cyrus, Co.

Fire Extinguishers.
Badger, E. B., & Sons Co.

Fire Hose.
Eureka Fire Hose Co.

Fire Hydrants.
Norwood Engineering Co.

Fire Insurance.
Home Insurance Co.

Fire Proof Doors and Windows.
Badger, E. B., & Sons Co.

Flax, Tow, Hemp and Jute Machinery.
Fairbairn-Lawson-Combes-Barbour, Ltd.

Fluted Rolls.
Hood, R. H.
Leigh, Evan A.
Jefferson, Edward & Brother.
Riley, C. E., Company.
Thurston, A. G., & Son.

Flyers.
Bodden, Wm., & Son, Ltd.
Calder Machine Works.
Hopkins Machine Works.
Jefferson, Edward & Brother.
Leigh, Evan A.
Textile Machinery Co.

Forges.
Sturtevant, B. F., Co.

Forwarders.
Salvator Transfer, Inc.

Friction Clutches.
—See Clutches.

Friction Cones.
Evans, G. Frank.

Friction Rings (Cork Insert).
National Brake & Clutch Co.

Fuel Economizers.
Buffalo Forge Co.
Sturtevant, B. F., Co.

Fulling Mills for Woolen Goods.
Hopkins Machine Works.
Hunter, Jas., Machine Co.
Kenyon, D. R., & Son.

Furnaces (Automatic Smokeless).
Murphy Iron Works.

Garnetts.
Leigh, Evan A.
Smith & Furbush Machine Co.

Gas Blowers and Exhausters.
Sturtevant, B. F., Co.

Gas Engines.
Jones, Lewis.

Gaskets (Superheated Steam).
Power Specialty Co.

Gassing Machines.
Stubbs, Joseph.

Gauges.
Crosby Steam Gage & Valve Co.
Walworth Manufacturing Co.

Gears.
Farrel Foundry and Machine Co.
New Process Raw Hide Co.

Gear Cutting.
Farrel Foundry and Machine Co.

Gear Cutting Machine.
Whiton, The D. E., Co.

Generating Sets.
Buffalo Forge Co.
Crocker-Wheeler Co.
Sturtevant, B. F., Co.

Geyser Water Heater.
Sargent's Sons, C. G., Corp.

Heating.
—See Ventilating Apparatus.

Heddles.
Stoddard, Haserick, Richards & Co.

Hoisting Apparatus.
Economy Engineering Co.

Hosiery Boards.
Pearson, J. T.

Hosiery Labels.
Kaumagraph Company.

Humidifying Apparatus.
American Moistening Co.
Buffalo Forge Co.
Cramer, Stuart W.
Parks, G. M., Co.

Hydraulic Rams.
Power Specialty Co.
Walworth Mfg. Co.

Hydro Extractors.
American Tool & Machine Co.
Broadbent, Thomas, & Sons.
Riley, C. E., Company.
Stoddard, Haserick, Richards & Co.
Textile Finishing Machinery Co.
Tolhurst Machine Works.

Illuminating Engineer.
Puffer, William L.

Insulating and Braiding Silks.
Sauquoit Silk Mfg. Co.

Insurance (Casualty, Fire and for Loss of Profits.)
Home Insurance Co.

Investments.
Cross Creek Coal Co.

Iron Glue.
Ament, H. B.

Jacquards.
Halton's, Thomas, Sons.

Knit Goods, Edgings, Trimmings, Etc.
Chapin, Geo. W.
Charles, W. B.
Cheney Bros.
Friedberger-Aaron Mfg. Co.
Krout & Fite Mfg. Co.
Weimar Bros.

Knit Goods, Finishing Machines Crochet, Etc.
Merrow Machine Co., The.
Nye & Tredick Co.
Robinhold Machine Co.
Scott & Williams.
Union Special Machine Co.
Willcox & Gibbs Sewing Machine Co.

Knitting Machine Cylinders.
Paxton & O'Neill.
Stafford & Holt.

Knitting Machinery.
Boss Knitting Machine Co.
Brinton, H., & Co.
Claes & Flentje.
Cooper, Chas.
Crane Mfg. Co.
Dubied, Edouard, & Co.
Excelsior Knitting Machine Mfg. Co.
Gormly, Robt. W., & Co.
Grosser Knitting Machine Co.
Hemphill Mfg. Co.
Jenckes, E., Mfg. Co.
Jones, Lewis.
Lamb Knitting Mach. Mfg. Co.
Leighton Machine Co.
Mayo, Geo. D., Knitting Machine Co.
Mayo Knitting Machine & Needle Co.
National Automatic Knitter Co.
Nye & Tredick Co.
Paxton & O'Neill.
Ruth Machine Co.
Scott & Williams.
Stafford & Holt.
Standard Machine Co.
Taylor, James.
Tompkins Bros. Co.
Walter & Co.
Walther, Otto.
Wildman Mfg. Co.

Knitting Needles and Supplies.
Breedon's, Wm., Son.
Brinton, H., & Co.
Continental Latch Needle Company.
Cooper, Chas.
Corey, Wm., Co.
Crane Mfg. Co.
Dodge Needle Co.
Excelsior Needle Co.
Grosser Knitting Machine Co.
Ives, L. T., Co.
Lamb Knitting Machine Mfg. Co.
Keystone Latch Needle Co.
Mayo Knitting Machine & Needle Co.
Page Needle Co.
Ruth Machine Co.
Wardwell Needle Co.

Lamps, Incandescent.
General Electric Co.
Pettingell-Andrews Co.
Westinghouse Electric & Mfg. Co.

Loom Pickers.
Garland Mfg. Co.

Looms.
Crompton & Knowles Loom Works.
Draper Company.
Kilburn, Lincoln & Co.
Leigh, Evan A.
Lowell Machine Shop.
Mason Machine Works.
Stafford, Geo. W., Co.
Stoddard, Haserick, Richards & Co.
Whitin Machine Works.

Loopers.
Beattie Machine Works.
Hepworth, John W., & Co.
Leighton Machine Co.

Lubricants.
Borne, Scrymser Co.
Dixon, Jos., Crucible Co.

Lubrication Engineer.
Davis, Wm. M.

Lubricators.
Detroit Lubricator Co.
Walworth Mfg. Co.

Lumpers.
Gerry, George, & Son.
Schofield, Wm., Co.

Machine Designers.
Adams, A. L.
Cameron Machine Co.

Machinery Dealers.
Jefferson, Ed., & Bro.
Lamb, J. K., Textile Mach. Co.
Schofield, Geo. L.
Taylor, James.

Machinists.
Adams, A. L.
Calder Machine Works.
Cameron Machine Co.

Machinists' Tools.
Whitin, The D. E., Co.

Mails.
Walder, J.

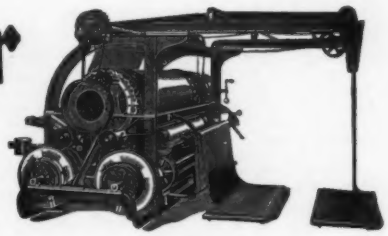
Measuring and Folding Machines.
Adams, A. L.
Curtis & Marble Machine Co.
Elliott & Hall.
Root, C. J., Co.

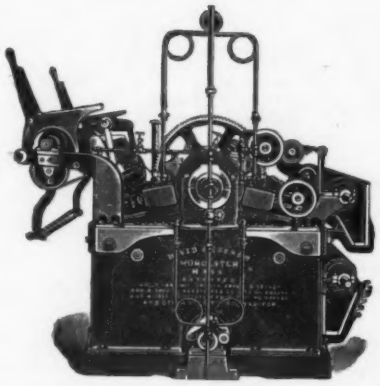
Mechanical Draft.
American Blower Co.
Buffalo Forge Co.
Massachusetts Fan Co.

Alphabetical Advertising Index, with page numbers, follows this list.

David Gessner

Worcester, Mass.

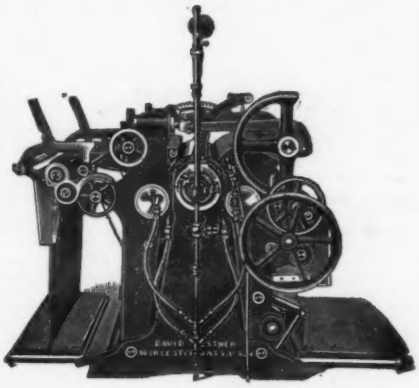




Latest
Improved
Cloth
Finishing
Machinery

—

Napping
Machines
and
Presses
a
Specialty



SIMPLICITY

THE K-A IDEA

KIP-ARMSTRONG COMPANY

Manufacturers of the
K-A Electrical Warp Stop-Motion
and other
TEXTILE ECONOMY DEVICES

New INVENTIONS in Mechanical Textile Devices Developed and Exploited.
Correspondence Solicited.

KIP-ARMSTRONG CO.
Pawtucket, R.I., U.S.A.

Mechanical Draughtsmen.
Sturtevant, B. F., Co.
Cameron Machine Co.

Mechanical Engineers.
American Blower Co.
Buffalo Forge Co.
Gilbreth, Frank B.
Philadelphia Drying Machinery Co.
Sturtevant, B. F., Co.

Mechanical Stokers.
Murphy Iron Works.

Mercerizers.
Globe Dye Works Co.
Home Bleach & Dye Works.
Lorrimer, Wm. H., Sons Co.

Mercerizing Machinery.
Buhlmann, A. W.
Butterworth, H. W., & Sons.
Klauder-Weldon Dyeing Machine Co.
Schwartz, L. H. A., & Co.
Smith, Drum & Co.
Textile Finishing Machinery Co.

Metallic Fire-proof Window Frames and Sashes.
Badger, E. B., & Sons Co.

Metallic Packing.
Power Specialty Co.

Mill Architects.
——See Architects and Mill Engineers.

Mill Builders and Engineers.
Ferguson, John W.

Mill Supplies.
American Supply Co.
Bamford & Smith.
Buckley's, Benjamin, Sons.
Burnham, E. E., & Co.
Crosby Steam Gage and Valve Co.
Easton-Burnham Co.
Eureka Fire Hose Co.
Garland Mfg. Co.
Jefferson, Ed., & Bro.
Lane, W. T., & Bro.
Leigh, Evan A.
Murphy, E. W., & Co.
Philadelphia Drying Machinery Co.
Pratt, R. C.
Riley, C. E., Company.
Richardson Bros.
Shaw, Victor, Ring Traveler Co.
Stephenson Mfg. Co.
Stoddard, Haserick, Richards & Co.
Thurston, A. G., & Son.
Vandegrift, Elias T.
Walworth Manufacturing Co.

Motors (Electric).
Buffalo Forge Co.
Crocker-Wheeler Co.
General Electric Co.
Sturtevant, B. F., Co.
Westinghouse Electric & Mfg. Co.

Napping Machinery.
Birch Bros., Somerville Machine Wks.
Buhlmann, A. W.
Curtis & Marble Machine Co.
Gessner, David.
Jones, Lewis.
Leigh, Evan A.

Noils (Silk).
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——See Ventilating.

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Riley, C. E., Company.
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Hart, Charles.
Minnich Machine Works.
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Sullivan Machinery Co.
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——See Power Transmission Machinery.

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Merrow Machine Co.

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International Correspondence Schools.
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New Bedford Textile School.
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——See Mchry. Dealers, also classified Ads.

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Draper Co., The.

Sewing Machines and Supplies.
Arlington Mch. Wks. (Arthur Birch, prop.)
Birch Bros., Somerville Machine Wks.
Curtis & Marble Machine Co.
Dinsmore Mfg. Co.
Fales, L. F.
Textile Finishing Machinery Co.
Union Special Machine Co.
Walter & Co.
Willcox & Gibbs Sewing Machine Co.

Shafting, Hangers, Etc.
——See Power Transmission Machinery.

Shearing Machinery.
——See Dyeing, Drying, Bleaching and Finishing.

Sheet Metal Work.
Scaife, W. B., & Sons.

Shell Rolls.
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Shoddies.
——See Wool Shoddies.

Alphabetical Advertising Index, with page numbers, follows this list.

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—See Bobbins, Spools, Shuttles, Etc.

Silk Machinery.
Arlington Mch. Wks. (Arthur Birch, prop.)
Butterworth, H. W., Sons Co.
Leigh, Evan A.
Mason Machine Works.
Stoddard, Haserick, Richards & Co.
Textile Finishing Machinery Co.

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Hall, I. A., & Co.

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Arlington Mch. Wks. (Arthur Birch. prop.)
Butterworth, H. W., Sons Co.
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Arlington Mch. Wks. (Arthur Birch, prop.)
Butterworth, H. W., Sons Co.
Curtis & Marble Machine Co.
Leigh, Evan A.
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Leigh, Evan A.
Lowell Machine Shop.
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Soaps.
Dobbins Soap Mfg. Co.
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Calder Machine Works.
Draper Company.
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Jefferson, Edward & Brother.
Leigh, Evan A.
Riley, C. E., Company.
Stoddard, Haserick, Richards & Co.
Vandegrift, Elias T.

Spindle Tubes.
Bamford & Smith.
Calder Machine Works.
Riley, C. E., Company.
Stoddard, Haserick, Richards & Co.
Vandegrift, Elias T.

Spinning Rings.
Draper Company.
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Buckley's, Benjamin, Sons.
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Spools.
—See Bobbins, Spools, Shuttles, Etc.

Spoolers.
Draper Company.
Easton & Burnham Machine Co.
Lindsay, Hyde & Co.
Lowell Machine Shop.
Payne, George W., & Co.

Stacks.
Scaife, W. B., & Sons.

Steam Boilers.
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Buffalo Forge Co.
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Steam Heating.
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Steam Pumps.
Dean Bros. Steam Pump Works.
Goulds Manufacturing Co., The.
Walworth Mfg. Co.

Steam Specialties.
Berry Engineering Co.
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Butterworth, H. W., Sons Co.
Crosby Steam Gage & Valve Co.
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Sturtevant, B. F., Co.
Textile Finishing Machinery Co.
Walworth Manufacturing Co.

Steam Traps.
Albany Steam Trap Co.
American Blower Co.
Buffalo Forge Co.
Sturtevant, B. F., Co.
Walworth Mfg. Co.

Steel Frame Construction.
Scaife, W. B., & Sons.

Stop Motion for Knitting Machines.
Boss Knitting Machine Works.
Ruth Machine Co.

Stop Motion for Looms.
—See Warp Stop Motions.

Alphabetical Advertising Index, with page numbers, follows this list.

Superheaters, Foster.
Power Specialty Co.

Tanks and Towers.
Chicago Bridge & Iron Works.

Tanks, Tubs and Vats.
American Water Softener Co.
Cypress Lumber Co.
Hall, Ames H., Son & Co.
Hopkins Machine Works.
Textile Finishing Machinery Co.
Tolhurst Machine Works.
Scaife, W. B., & Sons.
Stearns, A. T., Lumber Co.
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Beacon Narrow Fabric Co.
Chapin, George W.
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Textile Schools.
—See Schools.

Thin Place Preventers (Automatic).
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Palmer, I. E., Co.

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Economy Engineering Co.

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Bailey, Frank.

Turbines.
—See Water Wheels.

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American Mfg. Co.
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Sargent's, C. G., Sons.
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Sturtevant, B. F., Co.
Walworth Mfg. Co.

Warp Compressors.
Worcester Warp Compressing Machine Co.

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Draper Company.
Entwistle, T. C., Co.
Lowell Machine Shop.

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Altemus, J. K.
Draper Company.
Entwistle, T. C., Co.
Smith & Furbush Machine Co.

Warp Drawing Machines (Automatic).
American Warp Drawing Machine Co.

Warp Stop Motions.
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Draper Company.
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Washers (Cloth).
Arlington Mch. Works (Arthur Birch, prop.)
Birch, Arthur, Arlington Mch. Works.
Birch Bros., Somerville Machine Wks.
Butterworth, H. W., & Sons Co.
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Alphabetical Advertising Index, with page numbers, follows this list.

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Taylor, James.

Winders (Hosiery).
Altemus, Jacob K.
Easton & Burnham Machine Co.
Foster Machine Co.
Leighton Machine Co.
Lowell Machine Shop.
Payne, G. W., & Co.
Universal Winding Co.

Wood Preserving Paints.
Carbolineum Co.

Wood Pulleys.
Seginaw Manufacturing Co.

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Schofield, Edwin F.
Stoddard, Haserick, Richards & Co.
Tierney, Frank A.

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Burckhardt & Co.
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Altemus, Jacob K.
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Birch, Arthur, Arlington Mch. Works.
Birch Bros., Somerville Machine Wks.
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Esles, L. F.
Firth, William, Co.
Gessner, David.
Hood, R. H.
Hunter, Jas., Machine Co.
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Leigh, Evan A.
Lombard Machine Co.
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Schofield, Geo. L.
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Leigh, Evan A.
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Riley, C. E., Company.
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Smith & Furbush Machine Co.
Stoddard, Haserick, Richards & Co.
Tolhurst Machine Works.

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Harding, Whitman & Co.
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Lorimer, E. D.
Srernberg, Fred, & Co.

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Chapin, Geo. W.
Harding, Whitman & Co.
Littauer, Ludwig.
Lorimer's, Wm. H., & Sons Co.
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Sternberg, Fred, & Co.

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Sternberg, Fred, & Co.

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Boyer, B. F., Co.
Cannon Mills.
Chapin, George W.
Greene & Daniels Mfg. Co.
Harding, Whitman & Co.
Hyde, E. S.
Littauer, Ludwig.
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Sternberg, Fred, & Co.

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Littauer, Ludwig.
Lorimer, E. D., & Co.
Montgomery, J. R., & Co.
Sternberg, Fred, & Co.

Mohair Yarns.
Harding, Whitman & Co.
Littauer, Ludwig.
Montgomery, J. R., & Co.

Novelty Yarns, Tinsels, Silk Noils, Etc.
Jenckes Spinning Co.
Littauer, Ludwig.
Montgomery, J. R., & Co.
Sternberg, Fred, & Co.

Silk Noils.
Tierney, F. A.

Silk Yarns.
Chapin, Geo. W.
Cheney Bros.
Eddy & Street.
Ryle, Wm., & Co.
Sauquoit Silk Mfg. Co.

Woolen and Merino Yarns.
Boyer, B. F., Co.
Easton Rapids Woolen Mills.
Eddy & Street.
Germania Dye Works.
Hyde, E. S.
Jenckes Spinning Co.
Littauer, Ludwig.
Salkeld, A. D., & Bro.
Solis, Andrew J., Jr., & Co.

Woolen Yarns.
Adams, Joseph M., Co.
Littauer, Ludwig.
McCook, Walter.
Stephenson & Co.
Swoyer, J. D.

Worsted Yarns.
Boyer, B. F., Co.
Campion, Richard.
Harding, Whitman & Co.
Littauer, Ludwig.
McCook, Walter.
Stephenson & Co.
Pocasset Worsted Co.
Salkeld, A. D., & Bro.
Swoyer, J. D.

Alphabetical Advertising Index, with page numbers, follows this list.

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Alphabetical Index to Advertisements.

Acme Steel Goods Co. 52
Adams, A. L. 52
Adams, Jossph M., Co. 236
Albany Steam Trap Co. 40
Almond, T. R., Mfg. Co. 49
Altemus, Jacob K. 26
Ament, H. B. 215
American Blower Co. 271
American Cost Accounting Co. .. 213
American Diamalt Co. 242
American Ferrofix Brazing Co... 38
American Mfg. Co. 61
American Moistening Co. 39
American Pulley Co., The 38
American School of Correspondence 239
American Supply Co. 52
American Textile Appliances Co. 25
American Textile Specialty Machinery Co. 16
Am. Tool & Machine Co. 37
American Warp Drawing Machine Co. 59
American Water Softener Co. .. 48
American Wringer Co. 51
Arabol Mfg. Co., The 248
Arlington Machine Works 50
Ashworth Bros. 52
Atteaux, F. E., & Co. 249

Badische Company 62
Badger, E. B., & Sons Co. 33
Badger Fire Extinguisher Co. .. 33
Bailey, Frank 257
Ballou Yarn Co. 232
Bamford & Smith 271
Barrett Mfg. Co. 241
Beacon Fabric Co. 234
Beattie Machine Works 267
Berlin Aniline Works 248
Berry, A. Hun 33
Berry Engineering Co. 48
Birch, Arthur 60
Birch Brothers 33-47
Birdsboro Steel Foundry & Machine Co. 39
Bischoff, C., & Co. 249
Blaisdell, Jr., Co., The S. 232
Bodden, Wm., & Son, Ltd. 39
Boomer & Boschert Press Co. .. 228
Borgner, Cyrus, Co. 49
Borne, Scrymser Co. 38
Boss Knitting Machine Works .. 262
Bosson & Lane 242
Boston Belting Co. 24
Boyer, B. F., Co. 234
Breedon's Son, Wm. 269
Brinton, H., & Co. 261
Broadbent, Thomas, & Sons 199
Brockway & Meckenstrum 47
Brophy's Sons, T. 244
Brown, W. H., Co. 49
Buckley's, Benj., Son 215
Buffalo Forge Co. 20
Buhlmann, A. W. Outside Back Cover
Bull, William C. 267
Burckhardt & Co. 228
Burnham, E. E., Co. 48
Butterworth, H. W., & Sons Co. 1

Calder Machine Works 49
Cameron Machine Co. 52
Campion, Richard 234
Cannon Mills 231
Carbolineum Wood Preserving Co. 43
Cassella Color Co. 247
Catlin & Co. 231
Cell Drier Machine Co. 13
Chaffee Bros.' Company 51
Chapin, Geo. W. 237
Charles, William B. 236-238
Chemische Aniline Works 228
Cheney Bros. 237
Chicago Bridge & Iron Works .. 19
Claes & Flentje 264
Clayton & Bentley Co. 12
Cling Surface Mfg. Co. 200
Cohoes Dyeing Co. 248
Consolidated Rendering Co. 225
Continental Latch Needle Co. .. 269
Cooper, Chas. 267
Corey, Wm. Co. 269
Corn Products Refining Co. 22
Cramer, Stuart W. 210
Crane Mfg. Co. 265
Cresson, Geo. V., Co. 34
Crocker-Wheeler Co. 44
Crompton & Knowles Loom Works 64
Crosby & Gregory 213
Crosby Steam Gauge & Valve Mfg. Co. 228
Cross Creek Coal Co. 216-217
Curtis & Marble Machine Co. ... 47
Cypress Lumber Co. 250

Danker & Marston 200
Davidson, J. F. 244
Davis & Quick 208
Davis, W. M. 213
Dean Bros. Steam Pump Works 43
De Haven Mfg. Co. 45
Detroit Lubricator Co. 271
Dinsmore Mfg. Co. 41
Dixon, Jos., Crucible Co. 271
Dobbins Soap Mfg. Co. 31
Dodge Mfg. Co. 53
Dodge Needle Co. 269
Draper Company 3
Driver, Sam 238
Drouve, The G., Co. 251
Dubied, Edouard, & Co. 266
Duncan & Youngs 233

Easton-Burnham Co. 32
Eaton Rapids Woolen Mills 234
Economy Engineering Co. 228
Eddy & Street 234
Elliott & Hall 50
Entwistle, T. C., Co. 47
Eureka Fire Hose Mfg. Co. 40
Evans Friction Cone Co. 48
Excelsior Knitting Machine Mfg. Co. 259
Excelsior Needle Co. 269

Farbenfabriken of Elberfeld Co. 246
Fairbairn -- Lawson-Combe-Barbour, Ltd. 29
Fales, L. F. 44
Farrel Foundry & Machine Co. 28
Fawcett, Hughes 233
Felton, S. A., & Son Co. 48
Ferguson, John W. 213
Firth & Foster Co. 243
Firth, William, Co. 31
Fishkill Landing Machine Co. .. 51
Ford, J. B., Co. 224
Foster Machine Co. Outside Back Cover
Friedberger-Aaron Mfg. Co. 252
Frontier Supply Co. 215

Gandy Belting Co. 250
Garland Mfg. Co. 42
Geisenheimer & Co. 248
General Electric Co. 35
Germania Dye Works 249
Gerry, W. Geo., & Son ..... —
Gessner, David 205
Gilbreth, Frank B. 56-57
Ginsberg, A., & Son 233
Globe Dye Works Co. 244
Gormley, Robert W., & Co. 262
Goulds Mfg. Co. 212
Grant Yarn Co. 232
Greene & Daniels Mfg. Co. 230
Grosser Knitting Machine Co. .. 255

Haedrich, E. M. 249
Hall, Amos H., Son & Co. 251
Hall, I. A., & Co. 215
Halton's, Thomas, Sons 37
Harding & Fancourt 215
Harding, Whitman & Co. 231
Hart, Chas. 250
Hartford Steam Boiler Inspection & Insurance Co. 50
Heathcote, John, & Son 42
Hemphill Mfg. Co. 263
Hepworth, John W., & Co. 264
Hill, James, Mfg. Co. 47
Hoffman, Dewitt & McDonough 232
Home Bleach & Dye Works 243
Home Insurance Co. 240
Hood, R. H. 49
Hopkins Machine Works ..... —
Howard & Bullough Am. Machine Co. 66
Howe Mill Crayon Co. 233
Howson & Howson 213
Hungerford & Terry 46
Hunter, Jas., Machine Co. 15
Hyde, Edward S. 236

India Alkali Works 267
Industrial Law League 213
International Correspondence Schools 215
Ives, L. T., Co. 269

Jefferson, Edw., & Bro. 50
Jenckes, E., Mfg. Co. 260
Jenckes Spinning Co. 232
Johnson, Chas. A., & Co. 249
Jones, Lewis 269

Kalle & Co. 249
Kaumagraph Company 44
Kenyon, D. R., & Son 30
Keystone Latch Needle Co. 269
Kilburn, Lincoln & Co. 50
Kip-Armstrong Company 205
Kitson Machine Shop 7
Klauder-Weldon Dyeing Machine Co., The 222
Klipstein, A., & Co. 245
Krout & Fite Mfg. Co. 234

Lamb Knitting Machine Co. 267
Lamb, J. K., Textile Mach. Co. —
Lane, W. T., & Bro. 37
Leigh, Evan Arthur 11
Leighton Machine Co. 261
Lestershire Spool & Bobbin Co. 41
Lever Oswald Co. 17-54-55
Leyland, Thomas, & Co. 28
Lindsay, Hyde & Co. 232
Littauer, Ludwig 231
Little, Arthur D. 209
Lombard Machine Co. Outside Back Cover
Lorimer's, Wm. H., Sons Co. ... 244
Lowell Crayon Co. 232
Lowell Machine Shop 2
Lowell Textile School 32

Mason Brush Works ..... —
Mason Machine Works 10
Massachusetts Fan Co. 271
Maurer, F. W., & Sons Co. 232
Mayo Knitting Machine & Needle Co. 262
Mayo, Geo. D., Machine Co. 256
McCook, Walter 234
Merrow Machine Co. 258
Merwin Paper Co. 220
Metallic Drawing Roll Co. 47
Metz, H. A., & Co. 246
Minnich Machine Works 45
Mitchell, Jas. E., Co. 231
Montgomery, J. R., Co. 230
Monument Mills 230
Moore, C., & Co. 231
Moore, J. Clifford & Co. 214
Murphey, E. W., & Co. 52
Murphy Iron Works 35

Nanz, E., Clock Co. 51
National Automatic Knitter Co. 262
National Brake & Clutch Co. .. 29
New Bedford Textile School 223
New England Butt Co. 42
New Process Raw Hide Co. 14
New York Silk Conditioning Works 232
New York & New Jersey Lubricant Co. 236
Nicetown Mfg. Co. 249
Northern Water Softener Co. .. 34
Norwood Engineering Co. 270
Nuttall, George 215
Nye & Tredick Company 256

Orswell Mills 232

Page Needle Co. 269
Palmer, I. E., Co. ..... —
Parks, G. M., Co. 21

Pawtucket Dyeing & Bleaching Co. 244
Paxton & O'Neill 265
Payne, Geo. W., & Co. 264
Pearson, J. T. 266
Peerless Company, The 244
Pettes & Randall Co. 271
Pettingell-Andrews Co. ..... —
Philadelphia Drying Mchy. Co... 27
Philadelphia Textile Mchy. Co... 272
Philadelphia Textile School 46
Phila. Water Purification Co. .. 46
Plymouth Cordage Co. 226
Pocasset Worsted Co. 234
Power Specialty Co. 51
Pratt, Robt. G. 50
Providence Machine Co. 40
Puffer, W. L. 213

Reeves Pulley Co. 27
Rhode Island Fiber Spool Co. .. 13
Richardson Bros. 243
Riley, C. E., Company 199
Risdon-Alcott Turbine Co. 270
Robinhold Machine Co. 267
Roessler & Hasslacher Chemical Co. 247
Root, C. J., Co. 41
Rowland, Samuel 244
Ruth Machine Co. 265
Ryle, William, & Co. 237

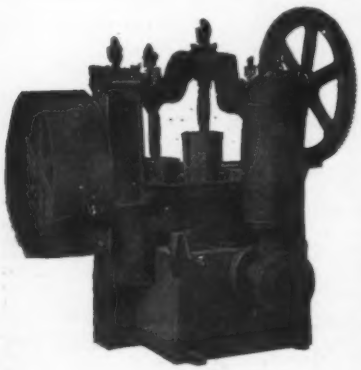
Saco & Pettee Machine Shops .. 5
Saginaw Mfg. Co. 49
Salem Elevator Works 36
Salkeld, A. D., & Bro. 231
Sargent's, C. G., Sons 30-233
Sauquoit Silk Mfg. Co. 237
Scaife, W. B., & Sons 250
Schnitzler, Chas. H. 267
Schofield, Edwin F. 236
Schofield, Geo. L. 215
Schofield, William, Co. 49
Schwartz, L. H. A. & Co. 58
Scott & Williams 8
Sellers, Wm., & Co. 35
Shaw, Victor, Ring Traveler Co. 52
Shultz Belting Co. 42
Simpson Bros.' Corporation 46
Slack, Wm. H. H., & Bro. 238
Smith, Drum & Co. 250
Smith, S. Morgan Co. 270
Smith & Furbush Machine Co... 272
Solway Dyeing & Textile Co. ... 244
Spence & Rideout 265
Stafford Co., The 4
Stafford & Holt 260
Standard Fiber Co. 45
Standard Machine Co. 263
Standard Paint Co. 207
Stearns, A. T., Lumber Co. 251
Stein, Hirsh & Co. 248
Stephenson & Co. 234
Stephenson Mfg. Co. 43
Sternberg, Fred., & Co. 231
Stewart & Sons 215
Stoddard, Haserick, Richards & Co. 207
Stubbs, Joseph 31
Sturtevant, B. F., Co. 203
Sullivan Machinery Co. 46
Swoyer, J. D. 234
Sykes, Walter F., & Co. 248

Taunton-New Bedford Copper Co 250
Taylor, Jas. 258
Tebbetts, E. L., & Co. 51
Textile Machinery Co. 49
Textile Machine Works 215
Textile Finishing Machinery Co. Inside Front Cover
Thayer, Edward M., & Co. 248
Thurston, A. G., & Son 50
Tierney, Frank A. 223
Tippett & Wood 43
Tolhurst Machine Works 36
Tompkins Bros., Co. 263
Toohey, M. J., & Co. 230

Union Special Machine Co. 257
Universal Winding Co. 9
Utica Willowvale Bleaching Co. 215

Vacuum Dyeing Machine Co. ... 36
Vandegrift, Elias T. 215
Vial, Pierre 50

Walder, J. 50
Walter & Co. 266
Walther, Otto 253
Walworth Manufacturing Co. Outside Back Cover
Wardwell Needle Co. 269
Waters, D. F. 41
Weimar Bros. 227
Western Thread & Dye Works.. 243
Westinghouse Electric & Mfg. Co. 32
Whitin Machine Works 6
Whittle, James H., Co. 44
Whitinsville Spinning Ring Co... 45
Whiton, D. E., Machine Co. 48
Wick Narrow Fabric Co. 23
Wildman Mfg. Co. 254
Willcox & Gibbs Sewing Machine Co. 259
Wilson & Co., Barnsley, Ltd. ... 40
Woodward Governor Co. 212
Woolford, G., Wood Tank Mfg. Co. 251
Woonsocket Mach. & Press Co. 18
Worcester Warp Compressing Machine Co. ..... —
Wright, Robt. A. 213



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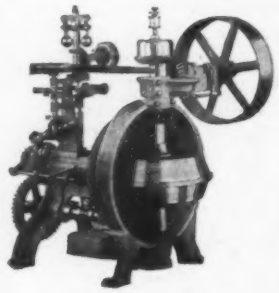

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or manager by a man 38 years of age, American, married. Is familiar with all grades of ribbed underwear manufactured for men, women and children. Having twenty years experience in the various departments of manufacturing the above. Am employed at present as assistant superintendent in one of the largest knitting mills in New York State. Would like to get with a firm that would give me part interest. Can put in a little money if wanted. Best of references. Address "Hustler," care Textile World Record. Boston, Mass.

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"Battle Creek" — note the thickness of the vein.

A limited amount of the bonds are still unsold.

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Situations Wanted.

The following advertisements are a portion of those of superintendents and overseers, of whom full particulars are on file at this office. Manufactu ers who may be in need of such men may address them in care of Textile World Record, Boston, or state their requirements directly, and the addresses of suitable men will be furnished without charge.

Mr. C. T. Donlevy, a practical mill overseer and superintendent, who has a wide acquaintance with mill men, gives special attention to this department. He would be pleased to hear from any of his friends who may be interested. Address Textile World Record, 144 Congress St., Boston, Mass.

SUPERINTENDENTS.

Superintendent, Assistant Superintendent or overseer of dressing, spooling and twisting. Worked on woolens, worsteds and cotton worsteds. Familiar with all makes of machinery. Good reference. 32 years of age, married. 4636, Textile World Record, Boston, Mass.

Manager or Superintendent of a woolen mill. Position wanted by a man, 50 years of age, Scotch, married. Worked on woolen and worsted goods, men's and women's wear, beavers, face finished goods. Twelve years as manager in his present position. Will be open for engagement about April 1st. 3862, Textile World Record, Boston.

Superintendent of a Worsted Yarn Mill or overseer of drawing, spinning and twisting. Position wanted by a man, 32 years of age, Scotch, married. Worked on wool from 1/4 blood up to fine domestic and Australian wools to all counts. Familiar with Prince, Smith, Lowell, Taylor, Wardsworth, Fayles & Jenks, Foster, Collins Bros.' machinery. Good references. 3847, Textile World Record, Boston.

Superintendent of woolen mill. Was in business for himself for years. He is now open for a position. Age 52, married, first-class references from commission houses. 3227, Textile World Record.

Superintendent of small woolen mill. Piece dyed goods, thibets, Venetians, meltons, etc. 3114, Textile World Record.

Superintendent or Assistant Superintendent in a large woolen mill. Position wanted by a man 52 years of age, married, English. Has worked on unions, satinets, cheviots, thibets, cloakings, overcoatings, dress goods, beavers and all kinds of woolen goods. Familiar with all kinds of woolen machinery. Good reference. 3776, Textile World Record, Boston.

Superintendent in a Woolen Mill or overseer of finishing in a large woolen mill. Position wanted by a man, 50 years of age, American, married. Has had a wide experience in large mills as superintendent; previous to taking up this end, was overseer of finishing in large mills. First-class recommendations. 3762, Textile World Record, Boston.

Superintendent Woolen or knitting mill. Position wanted by a man 40 years of age, American, married. Has had a wide experience on all kinds of woolen and worsted goods. Familiar with the American and English machinery. Good references. 3882, Textile World Record.

Manager or superintendent of a worsted mill. Position wanted by a man 33 years of age, married and English. Is experienced on all grades of wool and hair, and is familiar with all makes of worsted machinery. First-class references. 3596, Textile World Record, Boston, Mass.

Manager, superintendent or designer. Age 30; English; married. Experienced in England and in this country. Mohairs, all classes of worsted suitings, plain and fancy dress goods. 3184, Textile World Record.

Agent or Superintendent of a worsted or woolen mill. 45 years of age. Worked on all kinds of woolen goods from cheviots to fine cassimeres, worsteds and cotton worsteds. Familiar with all makes of woolen mill machinery. Could take a position at once. Good reference. 4576, Textile World Record, Boston, Mass.

Superintendent or Overseer of full fashioned knitting. Familiar with full fashioned underwear and hosiery and experienced on Ludwig, Shubert, Selzer, Richter, Cotton, Boesneck, Textile Machine Works, Riddier, Blackburn, Attenbury's, Moses Mellor's Machinery. Prefers a position in the West. Good reference. 4584, Textile World Record, Boston, Mass.

SUPERINTENDENTS.

Superintendent or Designer in a worsted or woolen mill. Worked on fine worsteds, crossbreds, piece dyes, serges, worsteds and woolen combination cloths, cross dyes, cotton worsted and wool and cotton mixes. Familiar with all makes of machinery. Good reference. 50 years of age, married. 4643, Textile World Record, Boston, Mass.

Assistant Superintendent, or Boss Weaver in a Woolen Mill. Position wanted by a married man, 28 years of age. Worked on all kinds of woolen goods, including cassimeres, suitings, dress goods, kerseys, thibets, meltons. Understands the Crompton & Knowles looms, has had experience in the carding and spinning room. A graduate of the International Correspondence School. Good reference. 4043, Textile World Record, Boston.

Superintendent. Would like position in South. Not particular about salary to start. Machinist and thoroughly acquainted with all kinds of card room machinery, also spinning frames. Taken superintendent course in textile school and has had 23 years of practical experience in the mill, mostly on fine yarn work. 3044, Textile World Record.

Superintendent of a Worsted Yarn Mill. Position wanted by a man, 38 years of age, American, married. Worked on all kinds of yarns, Bradford system. Is recommended by leading mills. 3855, Textile World Record, Boston.

Superintendent Small Yarn Mill. American, 25 years of age; worked on carded yarns, 8s to 60s, American cotton, white goods only. Also on all makes American machinery. Would accept position as carder, weaver or designer, where there was a chance for advancement. 3392, Textile World Record, Boston.

Manager or Superintendent in small yarn mill, or overseer of mule or ring spinning in a large mill. Position wanted by a man 42 years of age, American, married. Worked on all kinds of cotton goods and yarns. Familiar with mule, ring frames, spoolers, twisters, etc. Will not go to Canada. First class references. 3907, Textile World Record, Boston, Mass.

Assistant Superintendent or designer in a cotton mill. 34 years of age, American, married. Worked on denims, tickings, linings, dress goods, shirtings, cottonades, outings and plaids. Familiar with up-to-date machinery used in different departments in a mill. Will not go West or Canada. Good reference. 4591, Textile World Record, Boston, Mass.

Assistant Superintendent, assistant designer, pattern weaver, or salesman for textile machinery. Position wanted by a man 26 years of age, single. Has worked on woolens and worsteds. Is also a graduate of the Lowell Textile School, three years' course. Understands all kinds of machinery. Good reference. 4571, Textile World Record, Boston, Mass.

Superintendent or Manager in woolen mill, or designer, assistant superintendent, or both in a good mill. Position wanted by a man 55 years of age. American. Worked on fancy cassimeres, suitings, wool and worsted, face goods, kerseys, thibets, ladies' dress goods, cotton warps, plain and fancy, overcoatings, etc. Familiar with all machinery used in woolen mill. Will not go West, South or Canada. Good references. 3991 Textile World Record.

Cotton Superintendent, or superintendent and designer. Worked on all kinds of cotton, from 20s to 150s. Also large experience on lenos and other fancy goods. Some knowledge of Jacquards. All kinds of cotton machinery. Age 39, married. 2080, Textile World Record.

KNITTERS.

Assistant Superintendent or overseer of knitting in a hosiery mill. Worked on hosiery made from wool, shoddy and cotton mixes from 64 to 140 needle work. Familiar with Branson, Geo. D. Mayo, Hepworth loopers and Branson ribbers. 30 years of age, married. Good reference. 4631, Textile World Record, Boston, Mass.

Superintendent or Overseer of knitting and finishing in a hosiery or underwear mill. Has worked on hosiery, cotton, wool and merino, infants' cassimere toques, sweaters, sweater coats, plain ribbed underwear and ladies' Swiss ribbed vests. Familiar with the Lamb, Syferth, Danner, Grasser, flat, M. S. W. & Fisher, Hepworth loopers and S. & W. 7/8 automatic, Union Special, button and buttonhole machines. Good reference. 42 years of age. 4641, Textile World Record, Boston, Mass.

Manager or Superintendent of a knitting mill. 40 years of age, American. Has worked on high grade underwear of all kinds. Is a practical mechanic. Understands the manufacturing in all branches. Familiar with all makes of latch needle and sewing machines, bleaching and dyeing. Good references. 4538, Textile World Record, Boston, Mass.

Manager or Superintendent of a hosiery or underwear mill. Will be open for a position about March 1st. Understands the manufacture of seamless cutting hosiery, ladies', men's and children's underwear. Has had 20 years of experience in knitting mills and can refer any parties interested to manufacturers whom he has worked for. 4529, Textile World Record, Boston, Mass.

Superintendent of an underwear or hosiery mill. 31 years of age. Worked on ladies' shaped ribbed and men's and children's ribbed underwear. Also men's, women's and children's hosiery. Familiar with the Nye & Tredick, Stafford & Holt, Brinton, Scott & Williams, Union Special and Merrow machines. Good reference. 4534, Textile World Record, Boston, Mass.

Overseer of Knitting. Position wanted by a man 29 years of age, married. Worked on fleece lined, balbriggans, mercerized cotton, fancy worsted, wool merino nets, heavy and light weight ribbed work. Familiar with Campbell & Clute, Tompkins Bros., Bromley & Crane, latch needle, Scott & Williams, Nye & Tredick, Fisher, and Wildman machines. Good references. 3881, Textile World Record.

Overseer of Latch Needle Knitting. Position wanted by a man 27 years of age, single. Has worked on almost all grades of stitchers of ladies' and gents' cotton and worsted underwear. Familiar with Scott & Williams, Wildman, Snyder, Nye & Tredick, Stafford & Holt and Fisher machines. Can take a position at short notice. Good references. 3873, Textile World Record.

Superintendent or boss knitter. Worked on men's fine balbriggan, ladies', men's and children's wool underwear. Familiar with all kinds of knitting machinery. 27 years of age; American. 3259, Textile World Record.

Superintendent of Underwear or hosiery mill. Position wanted by a man 49 years of age, married, American. Has worked on men's, women's and children's underwear in flat, ribbed and full fashioned; also hosiery in cotton, wool and merino. Familiar with all makes of knitting machines from picker to finishing. Good references. 3993 Textile World Record.

Superintendent of Knitting. A man with 27 years' experience running knitting factories on sweaters, cardigan and ladies' golf jackets, also gloves and mittens. Understands all makes of knitting and finishing machinery used in manufacturing these goods. 45 years of age. Good reference. 4521, Textile World Record, Boston, Mass.

Superintendent of Hosiery Mill or Boss Knitter of underwear or sweaters. Position wanted by a married man, 26 years of age, American. Has worked on all kinds of hosiery, except full fashioned. Also underwear, sweaters, toques, fancy leggings, gloves and mittens. Is familiar with all makes of seamless hosiery machines, Leighton and Lamb. Good reference. 3305, Textile World Record, Boston, Mass.

SPINNERS.

Boss Spinner in a woolen mill. 32 years of age; American; familiar with Davis & Furber, Johnson & Bassett and English mules and twisters. First-class references. 3275, Textile World Record.

Overseer of Woolen Spinning. Position wanted by married man, 28 years of age; worked on all kinds of wool, cotton and shoddy mix goods on J. & B. mules. Good reference. Will not go West, South or Canada. 4083, Textile World Record, Boston, Mass.

Overseer of Knitting in a small mill or second hand in a large mill. 22 years of age, single. Worked on balbriggans, single and double, and fleece lined. Familiar with Tompkins, Campbell & Clute and Payne winders. Could take a position at short notice. Good reference. 4539, Textile World Record, Boston, Mass.

Overseer of Woolen Spinning in a small mill, or Fixer in a large mill. Single, 38 years of age. Has worked on all kinds of stock, cotton, wool and shoddy mixes. Familiar with J. & B. and D. & F. operators and mules. Could take a position at once. Good reference. 4092, Textile World Record, Boston, Mass.

Overseer of Spinning. American, with experience on nearly all classes of woolen and worsted goods, and on all machinery used in his work, wants position in the East. Best of references furnished. Wants first-class position. 3384, Textile World Record.

Overseer of Spinning in Woolen Mill. Position wanted by a married man, 40 years of age. Is familiar with Davis & Furber and Johnson & Bassett mules and operators and Wright's frames. Good reference. 4086, Textile World Record, Boston, Mass.

Overseer of Spinning in a woolen mill. Position wanted by a man 47 years of age, married. Has worked on fancy cassimeres, dress goods, flannels, satinets, kerseys, broadcloths, blankets, etc. Familiar with D. & F., J. & B., Paul and Bancroft mules. Will not go West, South, Canada, Pennsylvania or New Jersey. Good references. 3994 Textile World Record.

Overseer of Woolen Spinning, twisting and spooling. Position wanted by a married man, 45 years of age, American. Worked on all classes of goods, including knit goods. Familiar with the D. & F., J. & B., and Bancroft mules. Will accept a position anywhere but R. I. and N. J. Good reference. 4581, Textile World Record, Boston, Mass.

Overseer of Woolen Spinning or fixing. 41 years of age, married. Has worked on all kinds of woolen goods. Familiar with the D. & F. and J. & B. machines. Prefers N. E. States. Has one sewer and one burler in the family. Good reference. 4590, Textile World Record, Boston, Mass.

Overseer of Cotton Mule Spinning. 30 years of age, married. Worked on plain and fancy goods of all kinds. Familiar with the American and English makes of mules. Prefers a position in Mass., R. I., or Conn. Good reference. 4585, Textile World Record, Boston, Mass.

Overseer of Woolen Spinning. Position wanted by a man 42 years, American. Worked on all kinds of stock, cotton, woolen, shoddy mixes. Has had 14 years' experience as overseer. Familiar with D. & F., G. & B. and Brotherheads. Could take position at once. Good references. 3879, Textile World Record.

Overseer of Spinning, spooling, warping and slashing. Position wanted by a man 45 years of age, American. Has worked on all kinds of cotton goods. Familiar with Fales & Jenks, Whitin, Mason & Saco machines. Will not go West, South or to New York. Good references. 3910, Textile World Record, Boston.

Overseer of Spinning. Position wanted by a man 35 years of age. Has worked on all wool, wool and cotton and shoddy mixes. Is an experienced overseer and is familiar with English, Platt & Latham, Davis & Furber, Johnson & Bassett, Bridesburgh, Penn and Furbush mules. Good references. 3554, Textile World Record, Boston, Mass.

Overseer of Spinning in a cotton mill, or superintendent of a small yarn mill. Position wanted by a man 33 years of age, married, English. Worked on yarns from 40s to 150s. Familiar with all kinds of machines. Good references. 4016 Textile World Record.

WEAVERS.

Overseer of Woolen or worsted weaving. Worked on worsteds, cotton worsteds, woolens and dress goods. Crompton & Knowles looms. Will not go West, South or Canada. Good reference. 46 years of age, married. 4642, Textile World Record, Boston, Mass.

Overseer of Woolen Weaving, second hand or loom fixer. Worked on worsteds, cassimeres, ladies' dress goods, blankets and cheviots. Familiar with the Crompton & Knowles looms. Has two workers in the family. Could take a position at once and will go any place. 46 years of age, married. Good reference. 4620, Textile World Record, Boston, Mass.

Overseer of Cotton Weaving, second hand, or overseer of cloth room. Worked on sateens, twills, sheetings, prints, muslins and all kinds of plain goods. Familiar with Draper, Colvin and Whitin looms. Prefers New England, but will go any place for a good position. 45 years of age, married. Good reference. 4621, Textile World Record, Boston, Mass.

Overseer of Woolen Weaving. Worked on fancy and cotton worsteds, dress goods and woolens of all kinds. Familiar with C. & K. looms. 32 years of age, married. Good reference. 4637, Textile World Record, Boston, Mass.

Overseer of Weaving. Position wanted by a man 32 years of age and married. Has worked on woolen dress goods, suitings, cotton worsteds, worsted dress goods, kerseys, beavers and blankets. Is familiar with Crompton, Knowles, Furbush, Davis & Furber looms and dobby looms. Has first-class recommendations. 3544, Textile World Record.

Overseer of Woolen Weaving. Position wanted by a man 44 years of age, American, married. Worked on worsted and woolen goods of all kinds, also dress goods. Has one spooler, one sewer and one hander-in in the family. Could take position at short notice. Will not go West, South, New Jersey, New York or Canada. Good references. 3887, Textile World Record.

Overseer of Weaving in a woolen mill. Position wanted by a man 26 years of age, American. Worked on plain and fancy worsteds, cotton worsteds, dress goods, cassimeres, kerseys, venetians, flannels, etc. Familiar with Knowles, Crompton, Thayer looms. Will not go to Pennsylvania, New Jersey, South or Canada. Good references. 3981 Textile World Record.

Overseer of Weaving or second hand in a woolen mill. Married man, 34 years of age, American. Worked on broad cloths, sackings, covert cloths, suitings, kerseys, beavers, rain cloths and bed blankets. Familiar with Crompton & Knowles and Davis & Furber looms. Prefers a position in New England. Good reference. 4554, Textile World Record, Boston, Mass.

Overseer of Weaving or second hand in a cotton mill. 25 years of age, married, American. Worked on twills, sheetings, ducks, lenos, shirtings and motor tire fabrics. Good reference. 4545, Textile World Record, Boston, Mass.

Overseer of Weaving. Position wanted by a man 28 years of age and married. Worked on fancy shirtings, lenos, silk dress goods, lappets and plain goods. Familiar with Jacquard machines, Mason, Crompton & Knowles and Stafford dobbies, looms. 3474, Textile World Record, Boston.

Overseer of Weaving, or weaver and designer. American, 40 years of age, with experience on all grades men's wear and all makes of woolen looms, pickers, spoolers, twisters, etc., wants a position in the East. 3379, Textile World Record.

Overseer of Cotton Weaving. Has worked on plain sateens, fancy bedford cords, jacquard goods, lenos, cotton, silk and mercerized yarns, single and two ply. Familiar with all makes of cotton looms and also jacquards, single and double lift. Will not go West or South. 4503, Textile World Record, Boston, Mass.

Overseer of Cotton Weaving. 44 years of age, English, married. Worked on all kinds of cotton goods, plain and fancy. Familiar with American and English looms. Will go any place for a good position. Good reference. 4508 Textile World Record, Boston, Mass.

DESIGNERS.

Designer or Assistant Designer. Worked on sateens, fancy goods, lenos and dobby work. Familiar with the different makes of looms. Good reference. 24 years of age. 3252, Textile World Record, Boston, Mass.

Designer, Assistant Designer or overseer of weaving. Has worked on the best classes of tweeds, overcoatings, wool and worsteds. 39 years of age, married. Two workers in the family. Scotch. Good reference. 4625, Textile World Record, Boston, Mass.

Designer or Assistant Designer. Worked on fancy worsteds, mohair and alpaca linings. 31 years of age, single. Good reference. 4644, Textile World Record, Boston, Mass.

Designer or Assistant Designer. Worked on fine fancy worsted goods, all grades. 26 years of age, single. Good reference. 4634, Textile World Record, Boston, Mass.

Designer or superintendent. Ginghams, crepe, jacquards, cycle tires, filter cloth, vesting cloth, etc. Good recommendations. Middle aged man; English; married. 3169, Textile World Record.

Designer or Assistant Superintendent of a worsted or woolen mill. Position wanted by a man, 25 years of age, single. Has worked on fancy and cotton worsteds and woolens of all kinds. Has had seven years' practical experience in different departments of worsted and woolen mills. Good references. Could accept a position at once. 3851, Textile World Record, Boston.

Designer or Overseer of weaving, or boss dresser. Position wanted by a man 24 years of age, American, married. Has worked on cotton worsted. Familiar with Crompton & Knowles looms. Good references. Could take position at once. 3913, Textile World Record, Boston.

Designer or assistant superintendent. Worked on cotton warp flannel coverts, plain and fancy cotton warp, and all wool dress goods. First-class references. 3244, Textile World Record.

Designer on any class of dress goods waistings, mantle cloths, fine shirtings, etc. 3203, Textile World Record.

Designer. Worked on ladies' dress goods, shirtings and flannels and some jacquard designing; first-class recommendations; 33 years of age; married. 3285, Textile World Record.

Designer in a Cotton Mill. Position wanted by a man, 33 years of age, English; has worked on ladies' dress goods, shirtings, ginghams, lenos and jacquard patterns. Will not go west, south or Canada. Good reference. 3780, Textile World Record, Boston.

Designer, Boss Weaver or assistant designer or superintendent in a woolen mill. Position wanted by a man 28 years of age, single, American. Worked on men's wear, worsteds and woolens, dress goods, piece dyed worsteds, cloakings, plain and fancy. Familiar with Crompton & Knowles and Crompton & Thayer looms. Will not go West, South or Canada. Good references. 4010 Textile World Record.

Designer. A married man, 26 years of age. Worked on woolens, cassimeres, worsteds and cotton worsteds. Would like an interview with any manufacturer in need of a first class man. Good reference. 4512, Textile World Record, Boston, Mass.

Superintendent and Designer, or assistant superintendent or boss weaver in a woolen mill. Position wanted by a man 36 years of age, American, married. Worked on all kinds of woolen and worsted goods, also blankets. Understands all kinds of machinery, has worked in all departments of a mill. Good referencees. 3845, Textile World Record, Boston.

Superintendent and Designer in a woolen mill. Position wanted by a man, 39 years of age, single. Has worked on men's suitings, overcoatings, box cloth, cheviots, covert mixes made from wool, cotton and shoddy. First-class recommendations. 3871, Textile World Record.

Superintendent and Designer. Position wanted by a man 30 years of age, English. Has worked on all kinds of fancy cotton goods, and is familiar with all kinds of cotton looms. Good references. 3682, Textile World Record, Boston, Mass.

CARDERS.

Overseer of Woolen Carding. Worked on all kinds of goods made from wool, shoddy and cotton mixes. Familiar with all makes of cards and Boulette condensers. Prefers a position in the New England or New York States. Good reference. 50 years of age, married. 4638, Textile World Record, Boston, Mass.

Overseer of Woolen Carding. Worked on all kinds of woolen goods made from wool, shoddy and cotton mixes. Familiar with D. & F., Smith & London cards. 39 years of age, married. Good reference. 4632, Textile World Record, Boston, Mass.

Overseer of Woolen Carding. 48 years of age, married, American. Worked on all kinds of woolen, cotton and shoddy mixed goods. Exceptionally good man on low stock. Good reference. Has had 22 years of experience in the card room. 4530, Textile World Record, Boston, Mass.

Overseer of Carding in woolen or hosiery mill. Position wanted by a man 35 years of age, married, American. Worked on all classes of goods and all kinds of stock. Familiar with all kinds of American and English cards, and all kinds of condensers and feeds. Will not go West, South or Canada. Good references. 3988 Textile World Record.

Overseer of Carding. Position wanted by a man 34 years of age and married. Has worked on outing flannels, suitings, cassimeres, overcoatings, crashes, meltons, skirtings, kerseys, doeskins, broadcloths, coverts, cheviots and thibets. Is familiar with Davis & Furber, Cleveland, English cards and garnett machines. Good references. 3513, Textile World Record, Boston, Mass.

Overseer of Woolen Carding. Position wanted by a man, 47 years of age, American, married. Has handled all kinds of stock, cotton, wool and shoddy mixes on yarns from 1 to 6 run. Has been employed for a number of years in leading mills. First class reference. 3815, Textile World Record, Boston, Mass.

Overseer of Woolen Carding. Position wanted by a man, 39 years of age, married, American. Has worked on wool, shoddy and cotton mixed goods, dress goods, kerseys, overcoatings, cassimeres, etc. Familiar with D. & F. carding machinery. Good reference. 1766, Textile World Record, Boston.

Overseer of Carding in a woolen mill. Position wanted by a man 42 years of age, married, American. Worked on kerseys, dress goods, cassimeres, high and low stock. Familiar with all kinds of American machinery. Good references. 4005 Textile World Record.

Overseer of Woolen Carding. Position wanted by a man, 33 years of age, married, American. Worked on all kinds of cotton, shoddy and wool mixed goods. Familiar with all kinds of woolen carding machinery. Will not go west, south or Canada. Could take a position at short notice. Good reference. 3774, Textile World Record, Boston.

Overseer of Woolen Carding. Position wanted by a man, 35 years of age, married, American. Worked on cotton, wool and shoddy mixes and is familiar with very low stock, all kinds of woolen cards, Barker condensers. Good reference. 3800, Textile World Record, Boston, Mass.

Overseer of Woolen Carding. Position wanted by a man 56 years of age; married; American. Is experienced on all kinds of stock and is familiar with any make of carding machinery. Good references. 3608, Textile World Record, Boston, Mass.

Overseer of Woolen Carding. Position wanted by a man 39 years of age, married. Worked on all kinds of goods. Familiar with all kinds of machinery. Two workers in the family. Will not go West, South, Canada or Pennsylvania. Good references. 3987 Textile World Record.

Overseer of Carding. American, 36 years of age, with 6 years' experience as overseer. Has been working in large mills in Massachusetts and brings good references. Worked on all grades wool, cotton and shoddy mixes. Good manager of help and would consider a first-class second hand's position. 3375, Textile World Record, Boston.

FINISHERS

Overseer of Finishing or second hand in a worsted mill. Worked on fancy worsted piece dyes and dress goods. Familiar with all makes of finishing machinery. Good reference. 40 years of age, single. 4640, Textile World Record, Boston, Mass.

Overseer of Finishing in a woolen mill. Worked on broadcloths, carriage and billiard cloths, meltons, cassimeres, worsteds, thibets, etc. Familiar with all makes of machinery. 40 years of age, married. Will not go West, South or Canada. 4645, Textile World Record, Boston, Mass.

Overseer of Finishing. Worked on all classes of woolen goods, broadcloths, cassimeres, dress goods, kerseys, beavers and worsteds. Familiar with all makes of finishing machinery. Will not go South or Canada. Good reference. 29 years of age, married. 4626, Textile World Record, Boston, Mass.

Overseer of Finishing in a cotton mill, shipping clerk or boss weaver. Worked on ducks, sheetings, shirtings, tickings, denims, cottonades, ginghams, bed spreads, etc. Familiar with all makes of finishing machinery, C. & K., Lowell and Draper looms. Good reference. 30 years of age, married. 4639, Textile World Record, Boston, Mass.

Overseer of Finishing or assistant to manager. Understands knitting and finishing, but would prefer finishing department. Worked on ladies' light weight vests. Familiar with the Union Special, Merrow, sewing machines; McMichael, Wildman, Scott & Williams and Nye & Tredick knitting machines. 22 years of age, single. Good reference. 4646, Textile World Record, Boston, Mass.

Overseer of Finishing. Position wanted by a man thoroughly familiar with all kinds of cotton goods and all kinds of machines in common use in a colored cotton mill. Has finished ginghams, flannels, blankets, fancy dress goods and endless variety of goods made in a fancy cotton goods mill. Strictly temperate and reliable. First-class recommendations. 1649, Textile World Record, Boston, Mass.

Overseer of Finishing in underwear knitting mill, or superintendent of mill making ribbed knit underwear. Position wanted by a man 27 years of age, single. Worked on men's ribbed shirts, drawers and union suits, ladies' shaped vests, pants, union suits, etc. Familiar with Scott & Williams, Snyder & Fisher, Wildman, Champion, Cooper, Collette and other makes of knitting machines; Union Special, Wheeler & Wilson, Singer, Standard, Merrow and American sewing machines. Will not go to Rhode Island, Maine or New Hampshire. Good references. 4028 Textile World Record.

Overseer of Finishing of a small mill, second hand in a large mill, or overseer of burling and sewing. 27 years of age, married. Worked on fancy cassimeres, kerseys, meltons, thibets, beavers, broad cloths, dress goods and worsteds. Familiar with the different makes of finishing machines. Will not go to Penn., West, South or Canada. Good reference. 4579, Textile World Record, Boston, Mass.

Overseer of Finishing, or second hand in a large mill. Married, 28 years of age. Worked on fancy and plain worsteds, woolens, thibets, cotton worsteds, broad cloths, dress goods and kerseys. Familiar with the different makes of machines. Will not go West, South or Penn. Good reference. 4574, Textile World Record, Boston, Mass.

Overseer Woolen Finishing. Position wanted by a man 36 years of age, married, American. Worked on kerseys, beavers, meltons, thibets and cloaking. Has worked in a number of the leading mills. Familiar with all kinds of machinery. Will not go West or South. Good references. 3939, Textile World Record.

Overseer of Woolen Finishing. Position wanted by a man 35 years of age, married, American. Has worked on all kinds of woolen goods, unions, etc. Could take position at one week's notice. Good references. 3915, Textile World Record, Boston.

Overseer of Woolen Finishing. Position wanted by a man 40 years of age, single, American. Worked on all kinds of steam faced finished goods, broad cloths, kerseys, meltons, also cassimeres, worsteds and cotton worsteds. Good reference. 3813, Textile World Record, Boston, Mass.

DYERS.

Overseer of Dyeing. Worked on cotton piece goods, yarns, raw stock, woolen and worsted goods, slubbing and loose wool. Familiar with all kinds of cotton and woolen dyeing machinery. Will not go West or South. 25 years of age, single. A graduate of chemistry. Good reference. 3917, Textile World Record, Boston, Mass.

Overseer of Dyeing. Worked on worsted yarns, fancy serges, mohair, slubbing and resist colors. All makes of machinery. Prefers New England. 28 years of age, married. Good reference. 4627, Textile World Record, Boston, Mass.

Overseer of Dyeing in a woolen mill. 28 years of age, single. Worked on piece dyes, skein yarns, slubbing, raw stock, underwear, carriage cloths and rags. Understands all kinds of machinery. Good reference. 4555, Textile World Record, Boston, Mass.

Overseer of Dyeing. Married, 29 years of age. Has worked on raw stock, piece dyes, cotton, wool, worsted yarns and understands carbonizing in the piece or rags. Good reference. Could take a position at once. 4094, Textile World Record, Boston, Mass.

Fancy Dyer. Aged 37; American; married. Cotton, wool and silk. 3158, Textile World Record.

Superintendent of a Bleachery or Dye Works or overseer of mercerizing. Worked on all kinds of goods, including bed spreads, towels, ducks, sheetings, drills, cambrics, cotton flannel, bags, shoe lining and window shades. 42 years of age; married; English. 3274, Textile World Record, Boston, Mass.

Overseer of Bleaching. Position wanted by a man 34 years of age, English, married. Has worked on cotton bed quilts, marcellus and crochet, also yarns. Familiar with the Butterworth machines. Could be employed at short notice. Will not go West or Canada. Good reference. 3836, Textile World Record, Boston, Mass.

DYERS.

Overseer of Dyeing. Worked on broadcloths, carriage and casket cloths, cassimeres, raw stock, underwear and sweaters. Familiar with all makes of machinery. 27 years of age, married. Good reference. 4630, Textile World Record, Boston, Mass.

Overseer of Dyeing. Worked on yarns, piece dyes, raw stock, wool, cotton and shoddy mixes, also slubbing. Familiar with different makes of dyeing machinery. Will not go West, South or Canada. 38 years of age, married. Good reference. 4629, Textile World Record, Boston, Mass.

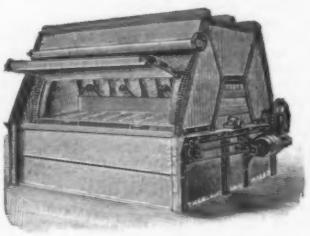
Overseer of Dyeing. Position wanted by a married man 26 years of age. Prefers a position in the middle west on hosiery; raw stock, yarns. Understands wool scouring and carbonizing. Familiar with all makes of machinery and also understands the finishing of hosiery. Good reference. 4567, Textile World Record, Boston, Mass.

Overseer of Dyeing. Position wanted by a man, 43 years of age, married. Worked on carbonized piece dyes, broad cloths, kerseys, worsted dress goods, cloakings, unions, raw stock, wool, shoddy and cotton. Could take a position at once. 4592, Textile World Record, Boston, Mass.

Overseer of Dyeing. 32 years of age, married; worked on woolen, worsted, unions, cotton worsteds, raw stock, cross dyes, cotton worsted yarns; good reference. 4097 Textile World Record, Boston, Mass.

Overseer of Dyeing or Second Hand. American; 25 years of age; worked on woolen piece dyes and raw stock and on different kinds of machinery used in dyeing. Would accept a position anywhere that would mean advancement. 3418, Textile World Record, Boston.

Overseer of Woolen Dyeing. American; 34 years of age; accustomed to broadcloths, kerseys, dress goods, raw stock, piece dyes and to all machinery used in his work. A1 man, with best of recommendations. 3180, Textile World Record.



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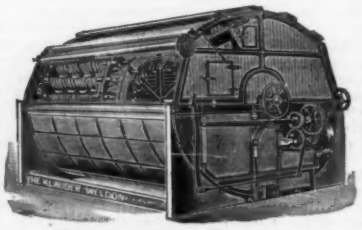

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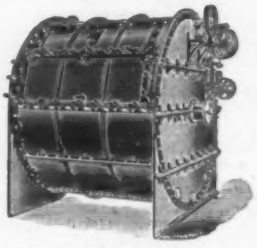
THE KLAUDER-WELDON DYEING MACHINE COMPANY

P. O. Box K, AMSTERDAM, N. Y.

Machines for Dyeing, Bleaching and Scouring Woolen, Worsted, Cotton and Silk Skeins—Slubbing—Raw Cotton and Wool, Waste, Rags, Shoddy, Hosiery, Underwear, Hats, Caps, Knit Cloth, Tapes, etc.



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Special Machines for Sulphur Colors

WILL EARN THEIR COST IN
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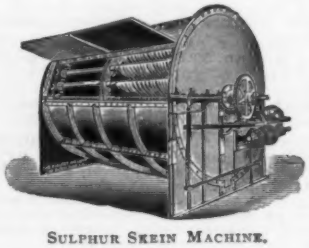
IN FROM
6 TO 12 MONTHS
ACCORDING TO CAPACITY



SULPHUR SKEIN MACHINE.

MISCELLANEOUS

Master Mechanic for Cotton or woolen mill. Familiar with steam and electric power and all machinery connected with either of the above. Good reference. 31 years of age, married. 4633, Textile World Record, Boston, Mass.

Overseer of Mule Spinning, or mule and ring spinning in a cotton mill. Worked on threads, warps, filling, hosiery yarns and counts from 6s to 180s, Egyptian and American cotton. Familiar with English and American mules. Wants a position in the North. Good reference. 40 years of age, married. 4624, Textile World Record, Boston, Mass.

Overseer of Spooling, Warping and Slashing in cotton mill. Position wanted by a man 35 years of age, married. Has worked on both white and colored cotton yarns from 8 1/2s to 120s, single and ply yarns, also silk. Familiar with Whitin, Draper, Howard & Bullough, Cohoes and Entwistle machines. One weaver in the family. Will not go West, South, Canada, Vermont or Pennsylvania. Good references. Can be employed at one week's notice. 3980 Textile World Record.

Overseer of Ring Spinning, spooling and warping in a cotton mill. Position wanted by a man 42 years of age, married, American. Worked on prints, ginghams, hosiery yarns, denims, thread and lace yarns. Familiar with Whitin, Lowell, Howard & Bullard, Fales & Jenckes and Biddeford machines. Will not go West, South or Canada. Good references. 4030 Textile World Record.

Overseer of Dressing, Spooling and Twisting. Position wanted by married man, 38 years of age, worked on all kinds of woolen goods, worsteds, dress goods. Good reference. 4042, Textile World Record, Boston.

Overseer of Dressing, Spooling and Winding. Worked on all kinds of woolen and worsted men's wear and ladies' dress goods. First-class references. 31 years of age; Scotch. 3269, Textile World Record, Boston, Mass.

Cloth Overseer or second hand in dress room. Englishman, 27 years of age, with experience on all classes cotton goods and the different kinds of machinery used in this work, is seeking position. Good references. 3380, Textile World Record, Boston.

Overseer of Tenter Frames in Cotton Mill. Position wanted by a man 44 years of age, married, Scotch. Has worked on sateens, lawns, mull skirtings and shirtings. Is familiar with Butterworth, Stewart and Granger tentering frames. Good references. 3651, Textile World Record, Boston, Mass.

Master Mechanic. Position wanted by a man 29 years of age. American, married. Has worked in large machine shops and held position as foreman in tool department and understands all duties connected with a master mechanic's position. Good references. 3921, Textile World Record, Boston.

Second Hand in woolen card room. Married man, 32 years of age. Worked on all kinds of stock, cotton wool and shoddy mixes. Good reference from leading mills. Could take a position at once. 4532, Textile World Record, Boston, Mass.

Color Mixer or Dyer. 53 years of age. Has worked on carpet yarns mostly, also plushes, fur hats, etc. First class recommendations from leading mills where last employed. Could take a position at short notice. 4531, Textile World Record, Boston, Mass.

Second Hand in dye house. Position wanted by a young man 22 years of age. Graduate in chemistry and dyeing in textile school. Has had four years' experience in mills, two as second hand, two as overseer of dyeing. Worked on men's, ladies' worsted piece dyes, stock and worsted and cotton yarns. Good reference. 4546, Textile World Record, Boston, Mass.

Chief Engineer, master mechanic or superintendent. Married man, 31 years of age. Familiar with machinery of all kinds and purposes, mostly for power. Hydraulic, electrical, direct, alternating current, high speed, engine, condensing, high pressure and elevators. Prefers New England. Good reference. 4561, Textile World Record, Boston, Mass.

MISCELLANEOUS.

Overseer of Ring Spinning or second hand. Worked on sheetings, shirtings, warp and filling. Familiar with the Whitin, Fales & Jenks machines. 31 years of age, married. Wife is a spooler. Good reference. 4635, Textile World Record, Boston, Mass.

Overseer of Ring Spinning. Worked on white goods and yarns from 8s to 70s warp and filling. Familiar with Whitin, Fales & Jenks, Mason, Howard & Bullough and Davis & Furber machines. 26 years of age, married. Good reference. 4628, Textile World Record, Boston, Mass.

Second Hand in card or mule room, or overseer in small card room. Position wanted by a man 25 years of age, American. Worked on Union mix goods. Familiar with D. & F. and J. & B. mules and American cards. Could take a position within ten days. Good references. Prefers position in the West. 3971 Textile World Record.

Overseer Worsted Combing. Position wanted by a man 38 years of age, married. Has worked on all classes of wools. Is familiar with the Crompton & Knowles "Nobles Combs," Taylor & Wordsworth and all kinds of gill boxes. Good references. 3903, Textile World Record, Boston.

Superintendent of a Bleachery or overseer of dyeing. Position wanted by a man 44 years of age, American. Worked on cotton piece dyes, plain and prints, spool cotton, yarns, warps, raw stock and hosiery. Familiar with all kinds of machinery used in an up-to-date bleachery and dye works. Good reference. 1680, Textile World Record, Boston, Mass.

Competent Cost Accountant. Position wanted by a young man at present with firm of business economists. Desires an executive connection with large manufacturing concern who are in need of a thoroughly wide awake man with executive ability and wide experience in textile and other lines and one who will guarantee to lower the cost of production in a large measure. Good reference. 4558, Textile World Record, Boston, Mass.

New Bedford Textile School

Day and Evening Instruction in

Picking,
Carding,
Combing,
Spinning,
Warp Preparation,
Weaving,
Designing,
Knitting,
Chemistry
and Dyeing.

CATALOGUE ON APPLICATION.

Address

New Bedford Textile School

New Bedford, Mass.

Success

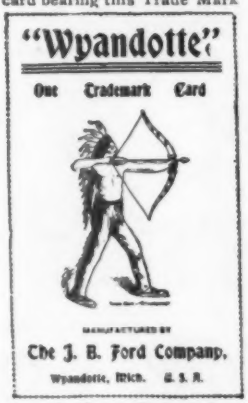
comes not by accident.

Don't expect the coming year's business somehow or in some way to run itself.

Competition is too busy to let us enjoy the good things of any trade without we earn them.

Wyandotte Textile Soda

None Genuine except with card bearing this Trade Mark



In Every Package.

enables you to hit the line of competition with more force, to increase your profits without increasing your cost, in short, Wyandotte Textile Soda is proving of greater worth each day.

If you are not using this soda, try it.

Order from your supply house now and ask us to send you free of cost our booklet "Textile Hints."

The J. B. Ford Co., Wyandotte, Mich.

Sole Manufacturers

THIS SODA HAS BEEN AWARDED THE HIGHEST PRIZE WHEREVER EXHIBITED.

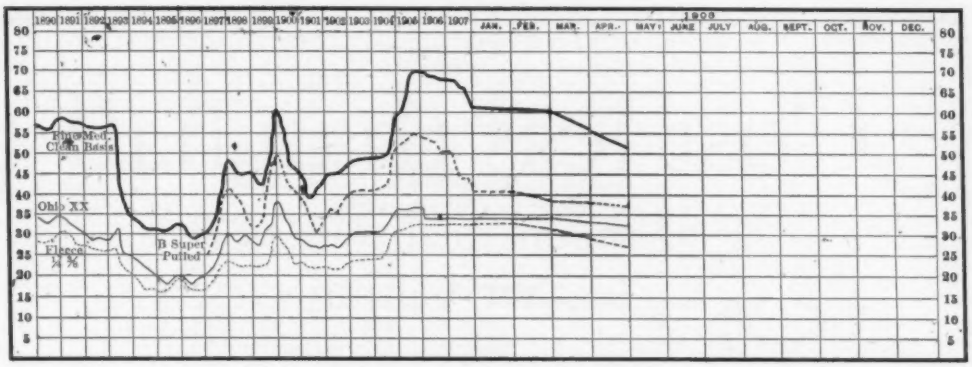


CHART SHOWING RANGES IN THE PRICE OF WOOL TO DATE.

The Wool Market.

Trade is nearly at a standstill in this market. The manufacturers, being short of orders for goods, are not disposed to purchase raw material. Wool dealers are likewise disinclined to assume the burden of carrying wool and are accordingly very bearish on the new clip. It looks now as if the grower would encounter especial difficulties in marketing his wool. The depression naturally resulting from these causes is aggravated by the general feeling of distrust which began last year and has been strengthened by the agitation of the tariff and other political questions affecting trade.

The encouraging feature of the situation is the policy pursued by manufacturers of reducing production to correspond with the falling off in the demand for goods. This is keeping stocks of goods small and making it certain that a revival of demand by the consumer will have an immediate effect on the more remote sources of supply. Nevertheless, it is useless to attempt to disguise the fact that the wool market, in common with other branches of business, is in the midst of business depression.

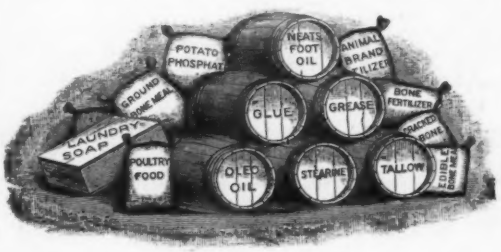
Massachusetts, Lawrence. The Pacific Mills, Arlington Mills, Essex Co. and American Woolen Co. are among the interests which have signed a petition to Congress favoring the Forest Reserve Bill.

Oregon, Pendleton. Charles Cooper, formerly of the Auburn Woolen Mills and Geo. Sault, formerly of Stayton, are reported as planning the organization of a new woolen mill company.

Pennsylvania, Darby. George Grayson's Dauntless Yarn Mills, in which he manufactures woolen and worsted yarns, 5s to 30s on 2 sets, 300 woolen spindles and 1,000 worsted spindles, is very busy in both departments. He also conducts a dye house, dyeing his own raw stock.

Pennsylvania, Philadelphia. J. R. Foster & Sons, 2d and Clearfield Sts., dyers and finishers of woolen and worsted yarns and slubbing and cotton woolen, worsted and mixed goods, report that the trustee, who has been in charge of their business, will be discharged within the next few weeks, the business reverting to its former owners.

*Tennessee, Tullahoma. The Board of Trade is endeavoring to raise $100,000 in stock subscriptions in order to secure the location of the woolen and worsted plant which, it was reported, was considering this place as a home for its industry.



Tallow for Sizing Especially Prepared

FOR COTTON AND WOOLEN MILLS

Consolidated Rendering Co.

40 N. Market Street, Boston.

Cost less than half

as much to install as leather belting

and costs much less for up-keep, have wonderful tensile strength, great durability and wide adaptability to the most difficult requirements. The proven advantages here given should make it worth your while to investigate the merits of

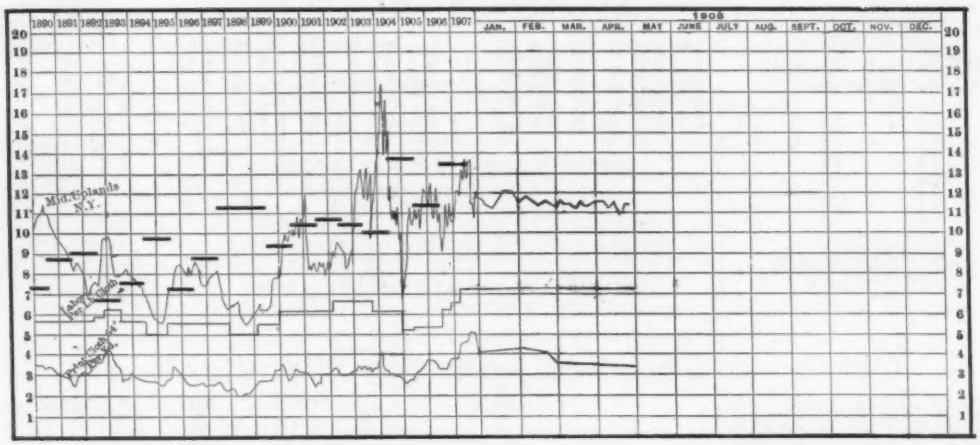
Plymouth Manila Rope Drives

Plymouth Manila Rope Drives

are ideal where centers of driving and driven shafts are close together or a considerable distance apart, when driving and driven shafts are not parallel, where absence of slip, quietness and freedom from electrical disturbances are desired. Booklet on "Rope Driving" sent on request.

Plymouth Cordage Co.

North Plymouth
Mass.



The short, heavy, horizontal lines indicate the size of the cotton crops in millions of bales.
CHART SHOWING RANGE IN THE PRICE OF COTTON TO DATE.

The Cotton Market.

The depression in the goods market is responsible for the drop in the price of cotton. Speculation has been absent, and as a result the market has encountered one of those rare periods during which prices have reflected the balance of supply and demand. Indications that the present crop is to be of moderate size have not prevented the decline, because the trade has become convinced that the crop will be amply sufficient to meet all demands likely to be made upon it. The movement into sight is over 2,000,000 bales behind that of last year, as shown by the following estimate by the Chronicle from Sept. 1 to April 24 for a series of years:

1907-08 April 24	10,221,116 bales
1906-07 April 25	12,343,611 bales
1905-06 April 27	9,736,757 bales
1904-05 April 28	11,306,418 bales
1903-04 April 29	9,376,051 bales
1902-03 May 1	9,895,994 bales

The same authority estimates the world's visible supply on April 24 at 4,031,198 bales, as compared with 4,927,085 bales on same date in 1907, 4,349,886 bales in 1906, and 4,160,316 bales in 1905.

*North Carolina, Dallas. The increase in the capital stock of the Monarch Cotton Mills from $75,000 to $90,000 will not be used to enlarge the plant.

North Carolina, New London. It is reported that the New London Development Co. will erect a large cotton mill upon the completion of the Whitney Co.'s electrical plant.

North Carolina, Rutherfordton. Jos. C. Smith of Shelby has been appointed receiver for the Levi Cotton Mills Company in place of A. C. Miller who was appointed temporary receiver. It is stated that the mill will be sold at public auction an August 1.

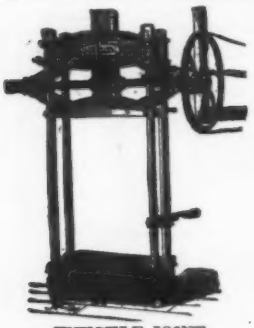
South Carolina, Greenville. There is a report that B. A. Morgan is interested in the organization of a new cotton mill company.

South Carolina, Jonesville. The Jonesville Mfg. Company is running its plant 40 hours a week.

*South Carolina, Newberry. Edward R. Hipp, who was reported in November as purchasing a site suitable for cotton manufacturing, advises that he has made no attempt to organize a company. The project will be held up until the fall of this year.

Tennessee, Nashville. A. H. Robinson has bought the property of the old Nashville Cotton Mills for $15,000. The purchase is made as an investment.

WEIMAR BROS. MANUFACTURERS OF Cotton Mercerized Tapes,
SPOOL TAPES, BINDINGS AND NARROW FABRICS FOR UNDERWEAR AND OTHER TRADES.
Phone Connections. Works, 2046-48 Amber Street, PHILADELPHIA, PA.



KNUCKLE JOINT.

BOOMER & BOSCHERT

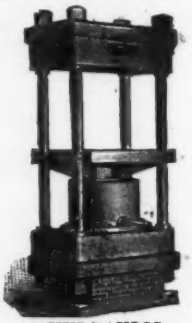
BALING PRESSES

ARE THE STANDARD

Hydraulic or Knuckle Joint
Any Size .. Any Power

Boomer & Boschert Press Co.

338 West Water S., SYRACUSE, N. Y.
Southern Agent, A. H. WASHBURN, Charlotte, N. C.



HYDRAULIC.

Get Your Supplies from the Manufacturers.

EXCELSIOR WOOL OIL COMPOUND AND COTTON SOFTENER

Established 1841

Burckhardt & Co.

Cincinnati, O.

The Excelsior Compounds are the best lubricating and softening products for wool, cotton, wool and cotton mixed. Eliminates the scouring process and effects large savir g in time and soap. They will not gum in the cards.
Write for prices and particulars.

OLIVE OIL TALLOW SOAP

LARD OIL

Handles heavy cases in a Time-Saving Way—The Economy Steel Tiering Machine

Goods are put in place with ease and economy. The largest amount of stock can be stored in the smallest possible space and yet be instantly accessible. In use in representative mills. Investigate its merits and 'twill be in use in yours. Write for prices.

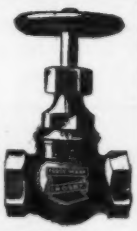
Economy Engineering Co. 58-64 N. Jefferson St. Chicago, Ill.

A Rigid Examination Reveals No Defects in the

CROSBY SPRING-SAVE GLOBE AND ANGLE VALVE.

NO BETTER VALVE CAN BE MADE.

All Working Parts Renewable Without Removal from Piping. ALL PARTS INTERCHANGEABLE. THEY have a full opening through them. WHEN COMPLETED ARE TESTED under more than 400 lbs. pressure. We guarantee them NOT TO LEAK AT HIGH PRESSURES. MADE IN BRASS AND IRON in the various styles furnished to the trade. Try One or More Valves and BE CONVINCED.

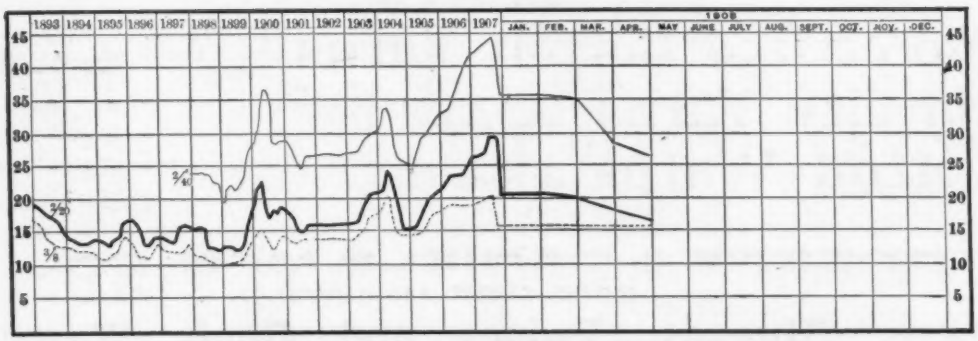


CROSBY STEAM GAGE AND VALVE CO.

Stores: BOSTON, NEW YORK, CHICAGO, LONDON.

Office and Works: BOSTON, MASS.

Yarn Department.



GRAPHIC CHART SHOWING RANGE IN THE PRICE OF COTTON YARN TO DATE.

The Cotton Yarn Market.

The yarn market has not brightened at all during the past few weeks; in fact, prices have continued to decline, and we believe that yarns today are selling on as close a basis as they have ever sold. We believe the majority of contracts that have been booked recently have been taken at a loss either to spinners or commission houses. There seems to be no bottom to the market, and the decided weakness in the cotton market during the past month has upset all chances for high prices on yarn in the near future.

The hosiery manufacturers have been busier than any other line of textile manufacturers recently. The weaving trade and underwear manufacturers have been very dull. Prices today are about as follows:—

Eastern Cops.

6s	17½
8s	18
10s	18½
14s	19½
16s	20
18s	20½
20s	21
22s	21½
24s	22
26s	22½
30s	23½
34s	24½
36s	25½
40s	26½

On cones, ¾c. more up to 14s; 1c. more from 15s to 22s; 1½c. from 23s to 35s, and 2c. above that.

Eastern Two-Ply Skeins, Carded Peeler.

12s	20
14s	21
18s	22
20s	23
24s	24
26s	24½
30s	25
36s	28
40s	29
45s	37
50s	40
55s	45
60s	49

Eastern Two-Ply Warps, Carded Peeler.

2/30s	25
2/36s	28
2/40s	29
2/45s	38
2/50s	41
2/60s	50

Egyptian Weaving Yarns.
Single Skeins Combed.

30s	36
36s	37½
40s	38½
45s	40
50s	46
55s	49
60s	53
70s	58

Massachusetts, Clinton. Construction work on the new mill for the Bigelow Carpet Co. has been discontinued temporarily owing to difficulties between the contractor and the carpenter's union.

Massachusetts, Gloucester. It is reported that the Linen Thread Co. will remove the net manufacturing machinery from the H. & G. W. Lord Company's plant in Boston to the Gloucester Net & Twine Company's plant of this place.

New Hampshire, Dover. The Cocheco Mfg. Company, which has been running on a reduced schedule for some time past, is now operating on full time.

THE J. R. MONTGOMERY CO.,

Windsor Locks, Conn.

MANUFACTURERS OF

Mercerized Cotton Yarns Gives the High Silk-Like Lustre in Knit Goods and Woven Fabrics.

Novelty Yarns Boucle, Bourette and Spirals, in Cotton, Wool, Worsted, Mohair and Silk.

Cotton Warps on Beams, Jack Spools and Tubes. In Fancy, Twist, Colors and Printed.

GREENE & DANIELS MFG. CO.,

COMBED, CARDED AND GASSED

Yarns, Threads, Twines and Chain Warps.

DYE SULPHUR BLACKS DIRECT IN COPS, CONES OR TUBES.

Colored and Bleached Yarns Furnished in any manner desired by the trade.

Pawtucket, R. I.

MONUMENT MILLS,

Manufacturers of

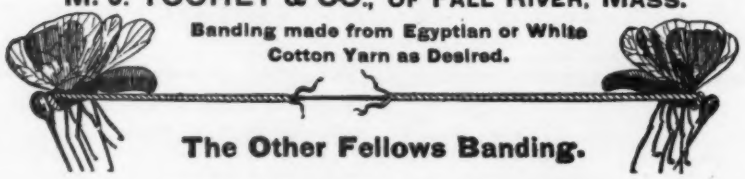
White, Colored, Fancy and Double Twist

COTTON WARPS

HOUSATONIC, MASS. 4s to 60s.

M. J. TOOHEY & CO., OF FALL RIVER, MASS.

Banding made from Egyptian or White Cotton Yarn as Desired.



The Other Fellows Banding.

The Merwin Paper Company

Hartford, Conn.

Press Papers and Fender Boards

Correspondence Solicited

Mills at Rainbow, Conn. Address Inquiries to Rainbow, Conn.

The Philadelphia Market.

Southern frame spun cones:—

7s and coarser	16½
8s and 9s	16¾
10s	17-17½
12s	17½-18
14s	18-18½
16s	18¼-19
18s	19
20s	19¼
22s	20
24s	20½
26s	21
30s	22
40s	28
50s	39

Southern high grade mule yarn:—

Cones.

10s	19½
12s	20
14s	20½-21
16s	21½
18s	22
20s and 22s	22½-23
24s	23

Southern frame yarn, lower grades:—

6s and 8s	16
10s	16½

Eastern cones (high grade quality):—

10s	21
12s	21½
14s	22
16s	22¾
18s	23¼
20s and 22s	23¾-24

Skein yarn (mostly Southern):—

4s and 8s soft	15½-16
10s and 12s	16-16¼
14s to 20s	16-17
22s	17
14/2	15½-16
16/2	16
20/2	16½
30/2	18½-19
40/2	27
16/3 slack	16½
12/3 slack	16
8/3 carpet	15½
8/3 slack	15½
9/4 slack	15½

Warps (Southern):—

10s to 12s	16
14s	16
16s	16½
20s to 22s	17-17½
26s	19
14/2	16½
16/2	17
20/2	17½
24/2	18
30/2	19
40/2	28

Mixed colored yarns (mock twist, half colors):—

JAMES E. MITCHELL CO., COMMISSION MERCHANTS.

Cotton Yarns

AND COTTON CLOTHS.

122-124 Chestnut Street, PHILADELPHIA, PA.
73 Leonard Street, NEW YORK.
Brown Building, 185 Summer Street, BOSTON, MASS.
25 South Tryon Street, CHARLOTTE, N. C.

CATLIN & CO.,

Cotton Yarns.

345 Broadway, NEW YORK.
67 Chauncy Street, BOSTON.
128-130 Chestnut Street, PHILADELPHIA.
605 Medinah Temple, CHICAGO.

Harding, Whitman & Co.,

Dry Goods Commission Merchants,

COTTON AND WORSTED YARNS.

BOSTON. NEW YORK. PHILA.
CHICAGO. BALTIMORE. ST. LOUIS.

A. D. Salkeld & Bro.

COMMISSION MERCHANTS

DEP'T. FRED'K VIETOR & ACHELIS

COTTON YARNS

66-72 LEONARD STREET - - NEW YORK

Fred Sternberg & Co.

530 Broadway, - NEW YORK.

MERCERIZED
TURKEY RED
GASSED
} COTTON YARNS.

LUDWIG LITTAUER,

SUCCESSOR TO

MOELLER & LITTAUER, 109 Greene St., New York

SILK, WORSTED, WOOLEN YARNS COTTON AND MOHAIR

Polished Threads and Tinsel. Artificial or Wood Silk.
Mercerized, Turkey Red, Fine Gassed Yarns.

SILK MILL, BOONVILLE, N. Y.

High Grade Hosiery Yarn

White and Colors. All Numbers. Sewing Twines on Cones and Tubes

SPECIALTIES IN WEAVING YARN

Black and White. Double and Twist for Woolen Trade.

CANNON MILLS 53-5 Worth Street, New York
Philadelphia Office, 205-7 Chestnut St.

C. MOORE & CO.,

Manufacturers of

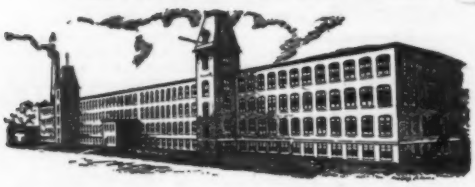
TWINES, THREADS AND YARNS

Jacquard Harness Twines of all kinds
on hand and made to order.

S. W. Cor. Fifth and Market Sts., Phila.

S. T. Crocker, Pres. W. F. Stiles, Treas.

ORSWELL MILLS



Fitchburg, Mass.

Capacity, 45,000 Spindles.

HIGH GRADE YARNS

From Egyptian and Peeler Cottons, Carded or Combed, in Chains and Skeins, on Balls, Beams, Spools, Cops, Cones, Tubes, Single or Twisted.

Cotton Yarns

Jenckes Spinning Company
Pawtucket, R. I.

Carded and Combed single and twisted Yarns and Threads from Peeler, Sea Island and Egyptian Cottons, on Cops, Cones and Tubes or in Skeins and Warps. Six Cord Thread Yarns a Specialty **Bleached or in colors**

GRANT YARN CO.,

COMBED AND CARDED COTTON.

YARNS 40's and above. AND **WARPS**

FITCHBURG, MASS.

F. W. MAURER & SONS CO.

MANUFACTURERS OF

TAPES, BINDINGS, NARROW FABRICS AND EDGINGS FOR NOVELTY CURTAINS

Office, 528 Cherry St. Factories, 529 & 531 Arch St. and 524 Cherry St., and Germantown Ave. & Bristol St.
PHILADELPHIA

Hoffman, DeWitt & McDonough Co., Inc.

Diamond Stay Bindings TRADE MARK

Manufacturers of

Tapes, Webbing and Bindings.

COTTMAN and G STS., PHILADELPHIA
CHELTENHAM, PENNA.
Bell Telephone, 235-D Cheltenham

Simplex Yarn Tables.

Showing equivalent sizes of different systems of numbering yarn; cotton, woolen, worsted, etc., so that the sizes of different standards may be quickly compared. Also contains a number of other valuable yarn tables for designers, manufacturers and knitters. PRICE 50c. Textile World Record, Boston.

Established 1880 Capital $20,000.00

New York Silk Conditioning Works
138-140-142 Spring Street
New York, N. Y.

Do you know how much water you are buying in your wool, cotton and silk? Write us.

Ballou Yarn Co.
PROVIDENCE, R. I.

Harness and Seine Twines and other Job Gassing, Winding, etc. All Numbers

GASSED YARN SPECIALTIES

C. M. BLAISDELL, Pres. and Treas. G. A. BLAISDELL, Vice-Pres. and Sec'y.
Established 1860—Incorporated 1893.

THE S. BLAISDELL, JR., CO.,

COTTON, EGYPTIAN PERUVIAN

American Long Staple a Specialty. Shipments direct to mill from Egypt, Peru and all American Southern Points.

CHICOPEE, MASS.

Cotton Waste Purchased on Yearly Contract from Mills.

Reels for Cotton WOOLEN AND WORSTED

Patented Hosiery Winders, Cop Winders and Spoolers.

LINDSAY, HYDE & CO.,
2124 to 2130 East York St., PHILADELPHIA, PA.

Lowell Crayons

Meet the requirements of any cotton, woolen or worsted mill.

May we send samples? 15 colors and white.

Lowell Crayon Co., Original Manufacturers **Lowell, Mass.**

Trade Mark on every box.

6s to 10s	18-19
12s to 14s	19½-20½
16s to 18s	22-25

Mock Egyptian, 2c. advance over white.

Egyptian, 5 to 6c. above best quality white.

Massachusetts, Oxford. It is reported that David M. Taft, proprietor of the Lamb Mill, North Oxford, and the Burnham Mill at Oxford, will shortly move the plants to some other place.

Massachusetts, Rochdale. Comins & Co., Inc., has resumed operations on full time. The mill was on a schedule of 4 days a week for 2 months. Cotton warp cloakings and suitings are manufactured on 43 looms.

Massachusetts, Warren. The Sayles & Jenks Mfg. Company is putting additional hands to work and it is reported will shortly be running on full time in all departments.

*New Jersey, Camden. The Becker-Denison Co., reported incorporated with capital stock of $75,000, will not manufacture. Mr. Denison has been selling agent for Chas. Becker, agent of Amsterdam, N. Y., for some time past. In order that Mr. Becker should be identified with Mr. Denison's end of the business, they have incorporated as the Becker-Denison Co. The address of this company is at Front and Chestnut Sts., Philadelphia.

New Jersey, Jersey City. It is reported that the Leolastic Weaving Company of Fall River has purchased ten acres of land in the vicinity of 31st St. and Newark Bay and will erect a new plant.

New Jersey, Camden. Geo. Brooks & Son, Inc., has been granted a charter with capital stock of $350,000. It is stated that the object is to manufacture textile fabrics. J. Allen Leeds, John C. Bonner and Jos. Swain are the incorporators.

New York, Brooklyn. The Brooklyn Ribbon Mills have filed articles of incorporation. Capital is $5,000. The incorporators are J. F. Levy, Lewis Kronthar and Ida Levy, all of New York City.

Oklahoma, Ravia. It is stated that 250 lots have been sold for the purpose of raising a bonus to be given the promoters of a cotton mill and that plans for a cotton manufacturing plant will shortly be completed.

Pennsylvania, Chester. The Byram Mfg. Co., since the death of its owner, D. Newsome, has been shut down. Investigation failed to reveal whether it would be started up again, but rumor has it that relatives of Mr. Newsome will take the plant over and again put it in operation. The mill contains 3 sets and 86 looms, which were operated on cotton worsteds, which they also dyed and finished.

*Pennsylvania, Philadelphia. The Wellington Worsted Mills Co., with a capital of $25,000, which was recently incorporated for the purpose of operating the plant run by Lucas, Cooper & Creamer, at Wayne Junction, has for its officers J. Tiers Reardon, pres.; James B. Cooper, sec. and treas. and Ernest S. Creamer, supt. They report a good business operating 40 broad and 40 narrow looms on dress goods, which they are selling direct.

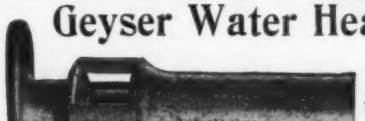
LINEN YARN IMPORTER.
HUGHES FAWCETT, 115 Franklin Street, NEW YORK.
Flax, Hemp and Jute Line and Tow Yarns,
For Weaving Purposes.
Linen Jacquard Harness Twines,
Fine Cotton Harness and Heddle Twines,
For Cotton, Silk, Woolen and Carpet Manufacturers.
Correspondence solicited. Samples promptly furnished.

DUNCAN & YOUNGS
95 Worth Street, NEW YORK
Practical Manufacturers of
YARNS, THREADS, TWINES, CORDS, ROPE
AND MILL SUPPLIES
Anything in the line you cannot get anywhere else apply to us.

FRANK A. TIERNEY,
TOPS, NOILS, ROVINGS, YARNS.
Wool, Silk, Mohair, Camels Hair, Ramie.
Garnetted Stocks
Silk also Ramie Tops and Noils, Ramie, Silk, and Silk Noil Yarns,
Special Textile Fibres and Novelties.
Wool Exchange Bldg., 260 West Broadway, New York.

MILL CRAYONS OUR SPECIALTY
Made in 15 Colors and White. 2 Grades.
Write for Quotations.
Howe Mill Crayon Co., Lowell, Mass.

A. Ginsberg & Son
Wholesale Dealers in
Manufacturers' Sewing Machines & Supplies
Union Special and Merrow Machines a Specialty.
532 West Broadway, New York

Geyser Water Heater

U. S. Pat 873,269
To attach to end of steam pipe for heating liquids in tanks or vats. Avoids that disagreeable noise caused by the direct introduction of a steam jet and raises the liquid to the required temperature in about 70% of time required by latter.
By its thorough circulation it distributes an even temperature throughout the tank. Price list upon application.
C. G. SARGENTS SONS CORPOR., Graniteville, Mass.

Pocasset Worsted Company

WORSTED YARNS

100 Boylston Street, - Boston, Mass.

French System. **B. F. BOYER CO.,** Bradford System.

MANUFACTURERS OF

WORSTED AND WOOLEN YARNS,

Office and Mill, River Ave. and Marlton St. CAMDEN, N. J.

KROUT & FITE MANUFACTURING CO.,

Manufacturers of

Silk, Cotton and Mercerized Narrow Fabrics

SPOOL TAPES A SPECIALTY.

Telephone Connection. Office and Mill, Allegheny Ave. and Emerald St., PHILADELPHIA.

WORSTED YARNS

RICHARD CAMPION.

SELLING AGENT FOR

Bristol Worsted Mills,
Highland Worsted Mills.
The French Worsted Co.

300 Chestnut Street,
PHILADELPHIA, PA.

EDDY & STREET,

Cotton, Woolen

Yarns and Braids

Worsted, Spun Silk.

PROVIDENCE, R. I.

Beacon Narrow Fabric Co.

Braids & Tapes

Notre Dame St. FALL RIVER, MASS.

Woolen and Merino YARNS

Eaton Rapids Woolen Mills,

EATON RAPIDS, MICH.

Bradford System French System

STEPHENSON & CO.

Worsted and Woolen Yarns

240 Chestnut Street
PHILADELPHIA.

Worsted AND Woolen Yarns

WALTER McCOOK

BELL TELEPHONE LOMBARD 3790 576 Bourse Philadelphia

Joseph D. Swoyer & Co.,

Manufacturers and Commission Merchants

Woolen, Worsted and Cotton Yarns

HOWARD AND BERKS STREETS,
PHILADELPHIA.

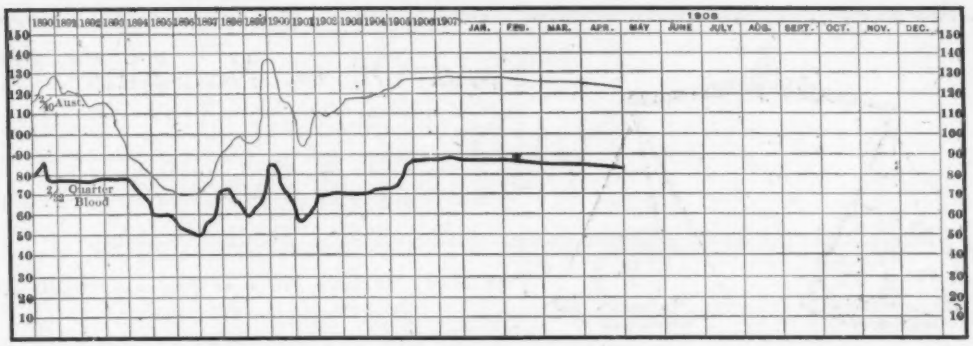


CHART SHOWING RANGES OF PRICE OF WORSTED YARNS.

Woolen and Worsted Yarn Market.

The condition of this market in this vicinity seems to be in no better shape than it has been for the past three or four months. Few buyers are in the market, and those are buying only in small quantities and for immediate consumption. The market to some extent is demoralized and manufacturers who have the cash can secure yarns at low figures, the spinner being compelled to make concessions in an effort to get business. The opinion is general here that after the conventions next month and the candidates for the next election are nominated that business will become more settled, in which case prices will again advance and spinners will be able to obtain a better figure for their yarns. Among the woolen yarn spinners some few are busy and in some instances have been compelled to enlarge their capacity to fill their orders.

The conditions in the men's wear trade, it is said, are improving, duplicate orders are being received and, while not large, are sufficient to encourage everybody connected with the industry. The clothing houses now have their salesmen on the road and report that they are taking a moderate amount of business from their customers, the majority of it being substantial business placed by conservative merchants. It is evidently for less than their needs for the fall season. This is preferable to the old way of speculative buying which always increases the cancellations. With a continuation of the good weather the retail clothiers are doing a very fair spring business, which naturally makes him feel more like preparing for the coming spring season. Collections have improved and while the improvement is not a boom yet it is a good steady growth. The selling agents and mills are getting their lines ready for the spring of 1909, looking over blankets, selecting colors and patterns. From present indications the great problem for next spring will be shades; everybody seems to want about fifty or more different shades and pieces. The old staple patterns in raincloths are selling very slowly, the trade asking for colors and fancy patterns; in fact, many of them would make very good suitings. The men's wear manufacturers are asking spinners at this time for 2/40, 2/36 and from single 30 down to single 24s and 20s.

The dress goods trade are now sampling and while they are receiving a smaller volume of business for next fall and winter than has been the case during past seasons there seems to be a better feeling all around. Quite a few orders for samples have been received and buyers who are now going abroad, it is said, have placed their orders for cloth before leaving the country. The cloths being shown and which seem to be meeting with a good sale are broadcloths of fine quality; checks in self colors, in blues, browns, greens and reds associated with black, diagonal effects, with some attention being given to plaids and voiles, the latter being represented in fall and winter assortments of many buyers.

The manufacturers of coat sweaters and fancy knit goods are reported as being more or less busy, with enough orders on hand to keep them going steadily for the next few months; these mills, however, are not placing orders for yarns in any large quantities, but are buying only on a hand to mouth basis.

There is very little demand for yarn from the manufacturers of underwear and what business is coming in is very small, the majority of the mills in this line are doing nothing of any account and many of them are arranging to shut down their mills until business improves.

We quote as follows

Fluid Oil *vs.* Non-Fluid Oil.

Three times the bulk. Three times the cost. Three times the weight but not a penny's worth more VALUE!

Non-Fluid Oils are improved general engine and machinery lubricants so compounded as to retain all the advantages of the best fluid lubricating oils, with none of the dripping and wasting away.

One barrel of Non-Fluid Oil will give equal or better service than three barrels of the best fluid oil ever refined.

Write for detailed information and samples.

ORIGINATORS AND SOLE MANUFACTURERS

The New York & New Jersey Lubricant Co.

14-16 Church St., New York City.

Dept. H.

William B. Charles,

Amsterdam, N. Y.

Cotton Yarns, Cotton Cloth, Sflesia, Sateens,

For the Underwear Trade.

EDWIN F. SCHOFIELD

ALL GRADES

PULLED AND FLEECE WOOLS

FOREIGN NOILS, CARPET WOOLS.

COTTON WASTE.

45 SOUTH 3RD STREET,

Philadelphia, Pa.

JOSEPH M. ADAMS CO.

WOOLEN YARNS,

Carpet Backing and Rug Yarns a Specialty.

ARCOLA MILLS,

Main St., foot of Centre St., Manayunk, Philadelphia.

Knitting and Weaving YARNS.

Cones, Cops, Warps, Skeins,

Single, Double, Three-Ply, etc.

Peeler, Egyptian, Mixed Colors.

Large Assortment.

EDWARD S. HYDE,

226 CHESTNUT STREET,

Philadelphia, Pa.

2/12 to 2/16 low common	60-62½
2/26 to 2/28 common	70
2/12 to 2/20 1/4 blood	72½-75
2/26 to 2/28 1/4 blood	75
2/32 to 1/4 blood	75-77½
2/20 3/8 blood	85
2/26 3/8 blood	85-87½
2/30 3/8 blood	87½
2/36 3/8 blood	87½-90
2/40 1/2 blood	1.02½-1.05
2/40 delaine	1.17½
2/50 delaine	1.20
2/40 Australian	1.25
2/50 Australian	1.30
2/60 Australian	1.45
2/24 lustre	85
2/28 lustre	87½
2/30 and 3/32 lustre	90-92½
2/36 lustre	97½-1.00
1/24 worsted and 80s single cotton for raincloths	1.00-1.05
1/24 worsted and 120 single cotton for raincloths	1.15-1.20

FRENCH SPUN YARN.

1/20 1/4 blood	78-80
1/20 high 1/4	85-87
1/20 3/8 blood	90-92½
1/20 1/2 blood	92½-1.00
1/20 high 3/8	92½-95
1/30 high 1/4 blood	87½-90
1/30 3/8 blood	92½-95
1/30 1/2 blood	1.02-1.05
1/40 1/2 blood	1.05-1.07
2/50 1/2 blood	1.25
1/50 delaine	1.20-1.22
1/40 Australian	1.30
1/50 Australian	1.35
1/60 Australian	1.45
1/70 Australian	1.50

Pennsylvania, Philadelphia. The Keystone Finishing Works has recently been started up by Hiram E. Perry in a building at Womrath and Tackawanna Streets, Frankford, which he has fitted up with 6 dyeing, 1 printing and 8 napping machines, for the purpose of napping, dyeing and printing cotton goods. The office of the works is at 602 Van Dyke St. Mr. Perry is also connected with the Edgewater Print Works at Frankford Ave. and Van Dyke Sts. He reports both concerns as being very busy.

CHENEY BROTHERS

Silk Manufacturers. So. Manchester, Conn.

Trams, Organzine and Spun Silks in the hank, or on spools and cones for woolen manufacturers.

Silks for electrical uses, insulation and special purposes made to order.

Knitting Silks, Ribbons and Piece Goods for Trimming Knit Goods.

Dress Silks, Satins, Linings, Printed Pongees, Foulards and Decorative Silks; Upholstery Goods, Ribbons, Sashes, Plushes and Velvets.

WILLIAM RYLE & CO.,

Foreign and Domestic

Spun Silk Yarns and Noils.

Domestic Thrown Silk of every description. Fine Pure Dye Silks for the woolen trade a specialty. Importers of European and Asiatic Raw Silk.

54 Howard St., cor. Mercer St., NEW YORK.

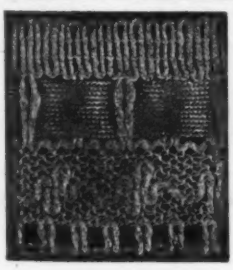
SAUQUOIT SILK MFG. CO.,

INSULATING AND BRAIDING SILKS.

ORGANZINE, TRAM & HOSIERY SILKS.

Fast Dye Organzines for Woolen Manufacturers a Specialty.

Mills: Bethlehem, Pa., Phila., Pa., Scranton, Pa. New York Representatives, Wm. Ryle & Co., 54 Howard St.—Phila. Office, 4015 Clarissa St., Nicetown.—Chicago Office, 188-190 Market St.—Boston Office, 78 Chauncy St.



GEORGE W. CHAPIN,

BRAIDS Cotton, Worsted, Mercerized, Cotton and Silk Twilled. **TAPES** Common, Twilled, Superfine and Plain 13 to 35s, white and colors on spools.

YARNS Cops, Skeins, Warps, Tubes and Cones. **THREADS** on Spools, Tubes, Cones. Unbleached Bleached and Colors for Manufacturers' use.

CROCHET LACE EDGINGS Latest Styles in Pant Laces.

229 Church Street 231 . . PHILADELPHIA

The Rag and Shoddy Market.

Very little business is being transacted in this market. Mills are buying only very immediate requirements, which are very small. The depression in business has had less effect on the rag and shoddy trade than on other branches of the textile industry, because the market for wool substitutes has long been depressed by the neglect of the cheviot finish. This had brought about conditions under which rags were exported to Europe. The sharp reaction in business during the past few months has put an end to this trade.

There is practically no demand for either cotton or wool waste, except in very desirable lots. The shutting down of the mills has reduced the supply, but this has not helped the situation. Prices are very irregular. We quote as follows:

SHODDIES AND EXTRACTS.

White yarn, best all wool	45-47½
White knit, all wool, best fine	30-40½
White knit, No. 2	32-37
Light yarn, extra fine	30-36
New pure indigo blue	30-32

Merino.

Fine light, all wool	25-26
Medium light, all wool	16-18½
Fine black, all wool	26-30
Fine dark, all wool, best grade	20-22
Medium dark, all wool, No. 2	15-17
Red knit stock, strictly all wool	20-22
Red flannel, all wool	
Dark blue for hosiery, strictly all wool, No. 1	20-23
Dark blue for hosiery, not all wool, No. 2,	15-17

WOOLEN RAGS.

Fine merchant tailors	10-12½
Choice light colors	15-17
Browns	12-14
Blacks	10-12
Fine blues, plain	9-12
Fine dark	10-13
Medium dark	6-8½

Worsteds.

Blue	14½-17
Black	21-22

Serges.

New black	13-16
New blue	

Flannels.

New scarlet	19-21
New blue	15-18
Cloakings	3-5½

William B. Charles,

Amsterdam, N. Y., U. S. A.

Cotton and Wool Wastes

COTTON YARNS

Contracts made with Cotton and Woolen Mills for Yearly Waste Production. Correspondence solicited. Shepperson's Code, 1878. Cable Address "Charles."

SHODDY W. H. H. SLACK & BRO. SPRINGFIELD, VT.

Established 1871 **FLOCKS**

Trouble in the Card Room?

I HAVE had a great deal of experience in straightening out troubles in wool card rooms. I believe I have worked in more wool card rooms than any other man in this country, and it has given me an unusual opportunity for noting all sorts of difficulties and the best way of overcoming them. Sometimes an outsider will quickly detect a point which the man always on the spot may overlook. Sometimes it is not necessary to visit the mills, as I can tell what the trouble is by correspondence. My charges are very reasonable and manufacturers and overseers may address me in confidence, as I am not looking for a permanent position as carder.

Clothing Cards a Specialty

SAM DRIVER, care Textile World Record, 144 Congress St., Boston.

Chemische Aniline Works

Manufacturers of

Anthracin & Coal Tar Products

24-26 Stone Street

New York

SOFTS AND KNIT STOCK.

Soft woolens, best	6-7
Old white flannels	21-22½
Old red flannels	13-16
Old blue flannels	8-10
Old plaids	8-9
White stockings	20-22½
White hood stock	21-22
Clear hoods	9-11
Blue stockings	8-9½
Fancy stockings, No. 1	9-12
Gray stockings	9-11½
Black stockings	9-11
Knit stock comforters	
Red knit	13-14
Light gray knit	10-12
New light fancies	15
New fancies	11-13

Merinos.

Light, fine	16-18½
Light, coarse	6-8
Fine, dark	11-13
Coarse, dark	4½-6
Blue	10-12½
Black	13-14½

FLOCKS.

Shear, fine white, all wool	10½-12½
Fine indigo blue, all wool	7-9
Fine black and blue, all wool	6½-8
Fine dark, all wool	2-5
Gig, fine, all wool	2-3½
No. 1 black, all wool cut	6-10

Pennsylvania, Philadelphia. The Allegheny Dye Works, of which Brehm & Stehle are the proprietors, have awarded contract for the building of a large addition to their present plant which will cost in the neighborhood of $15,000. They are dyers of cotton, woolen and mixed yarns and jutes and twines.

Rhode Island, Pawtucket. The Greene & Daniels Mfg. Company is building a storehouse, 128 by 50 feet. Work on the foundation was started last fall. The first floor will be used for a shipping room and the second floor for a store and warehouse.

Wisconsin, Madison. The State Board of Control is requesting proposals for furnishing all material and labor necessary for the construction of a binder twine factory at the state prison, Waupun, Wisconsin. Plans for the plant have been prepared by H. C. Koch and Sons, architects, Milwaukee.

*Wisconsin, Waupaca. The Waupaca Felting Mills have been reorganized with the following officers: James Proctor, pres.; A. C. Galloway, vice pres. and sec.; William Proctor, treas. and supt. The sum of $1,000 has been appropriated by the directors to build a new dye house during the summer.

Cyclopedia of

Textile Work

Seven large half red morocco bound volumes compiled especially for the Textile Manufacturer, Superintendent, Selling Agent, Designer, Overseer, Second Hand and Clerk—3,000 7 x 10 inch pages devoted entirely to good, sound, practical textile information—printed on fine quality paper and indexed for ready reference. 2,000 illustrations, diagrams, formulas, etc., to simplify and thoroughly explain the text. Every process in connection with textile work is thoroughly explained, from the raw fibre to the packing case. The simplest and most complete textile work yet published.

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Sent **FREE**, express prepaid, for 5 days' examination. If you wish to keep the books, send us $2.00 within 5 days and $2.00 a month until you have paid the special $19.80 price—regular price is $42.00. Notify us to send for the books at our expense if you do not wish to keep them. This great offer proves the merit of the work.

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Cotton Fibre—Picking—Carding—Combing—Drawing—Ring and Mule Spinning—Wool-Washing—Picking—Woolen Carding—Worsted Carding—Woolen Spinning—Worsted Drawing—Worsted Spinning—Simple Designs—Sateens—Backed and Ply Fabric—Velvet Jacquard and Leno Cotton—Woolen and Worsted Warp Preparation—Plain Weaving—Fancy Looms—Jacquards—General Loom Fixing—Spring Needle Knitting—Latch Needle Knitting—Hosiery and Underwear Knitting Machines—Textile Chemistry—Textile Coloring—Mordants—Natural Dyestuffs—Artificial Dyestuffs—Analysis of Fabrics—Wet Finishing—Dry Finishing—Processes for Finishing Standard Fabrics—Machines Used.

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Address.....

Occupation.....

Employer.....

FIRE, LIGHTNING, WINDSTORM.

The HOME INSURANCE COMPANY NEW YORK

Organized 1853. MAIN OFFICES, 56 CEDAR ST.

Cash Capital, $3,000,000.

ASSETS January 1st, 1908	$20,862,698
LIABILITIES (Including Capital)	13,659,487
RESERVE AS A CONFLAGRATION SURPLUS	500,000
NET SURPLUS OVER ALL LIABILITIES AND RESERVES	6,703.211
Surplus as Regards Policy-holders	10,203,211
Losses Paid Since Organization Over	110,000,000

Note amount of surplus after providing for San Francisco and other conflagrations.

HOME Policyholders everywhere have protection, which is sure, notwithstanding conflagrations anywhere.

IS prepared to entertain liberal lines on Sprinkler-Equipped and Modern Improved risks generally, having a special department for the consideration of such business.

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FREDERICK C. BUSWELL, Vice-Pres.
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AREUNAH M. BURTIS, Secretary.
CHARLES L. TYNER, Secretary.
HENRY J. FERRIS, Asst. Secretary.

Dyestuffs and Chemicals.

Acids.

Acetic, 100 lbs.	2.62-3.30
Citric, domestic	50-54
Oxalic	8-9½
Sulphuric, 66°, 100 lbs.	1.26-1.83
Muriatic, 18°	1.22-1.81
Tartaric crystals	28½-30

Miscellaneous Chemicals and Dyestuffs.

Acetate of lime, gray, 100 lbs.	2.54-2.86
Alum, lump	1.75-2.50
ground	1.80-2.15
powdered	2.85-3.35
Aqua ammonia, 26°	4-6½
Ammoniac, sal., gray	6½-8
Borax, bbls.	5½-6½
Brimstone, crude, ton	25-52
Copperas	63-83
Cream tartar, crystals	21-25
Fuller's earth, powdered, ton	18½-22
Glauber's salt	51-64
Potash, chlorate, crystals	10½-12
powdered	9½-11
carbonate	4-6
Soda, bicarbonate	1.65-1.75
Soda, caustic, domestic, 60 per cent.	1.75-1.90
Sal., American	75-80
Vitriol, blue	5-6
Acetate of soda	4-6½
Acid, picric, best crystals	27-28
tannic, commercial	34-40
Albumen, egg	62-74
blood	25-36
Alizarine, red	18
Aniline, oil	12-14½
salt crystals	13
Bichromate of potash, American	9-10
Bichromate of soda	7-8½
Bisulphite of soda	2-3
Cutch, mat	5-6½
Dextrine, imported potato	6½-8
Divi-divi, ton	44.00-68.00

Massachusetts, North Adams. The Windsor Print Works is adding a number of printers to its working force and preparing to turn off an increased production.

Massachusetts, North Adams. The Mayflower Worsted Mills are operating some departments all night and others until 9 in the evening. High grade worsteds are manufactured on 100 looms.

Pennsylvania, Philadelphia. Newton Jones, for many years operating a mill at 20th and Cora Sts., Germantown, on ingrain carpet yarns with 2 sets, 980 mule spindles, has retired from business. The plant has been shut down since August last and is for sale.

Pennsylvania, Philadelphia. J. Schweigart's American Dye Works, Trenton Ave. and Lippincott St., has been dismantled and the buildings razed for the purpose of making room for railroad improvements. Mr. Schweigart has retired from business.

Barrett Specification Roofs

TRADE B MARK

Missouri Pacific Freight House, St. Louis, Mo., 28 Years Old. Roof Still in Service.

There is no Excuse for a Leaky Roof!

THE object of a roofing is to protect the building it covers against the elements. Failure to do this continually and under all conditions is inexcusable. ***Yet roofs leak and losses follow.*** Both are unnecessary and easily avoided nine times out of ten.

Roofing laid according to The Barrett Specification is permanent. It is water-tight and it lasts. Any reputable contractor will guarantee such a roof for 10 years and experience proves that it will last 20 to 30 years without repairs and without attention.

The Barrett Specification is nothing more or less than specific directions covering materials to be used and the method of applying a first-class five ply Coal Tar Pitch and Gravel Roof.

It was prepared as an aid to architects, builders and owners. As the largest manufacturers of roofing materials in the world, we are interested in having same properly applied.

The materials for these roofs can be bought in any part of the U. S. and any roof contractor who follows the Specification will cover your building with a roof that cannot be duplicated for durability and low cost.

To anyone interested we shall be glad to send copies of the Barrett Specification and Booklet giving further information regarding roofing. Address nearest office.

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New York Chicago Philadelphia St. Louis Cleveland Allegheny
Cincinnati Kansas City Minneapolis New Orleans Boston London, Eng.

DIASTAFOR

The New Sizing, Finishing and Stripping Agent for the Textile Industry.

Specially recommended for the preparation of completely soluble and adhesive Sizes and Finishes, made from any kind of starch. Also for the preparation of Print Paste, Thickeners, etc.

The safest and most reliable medium for thoroughly removing the starch from Yarns and Fabrics of all kinds.

Representatives in the East are prepared to give personal attention and demonstration.

For particulars write

The American Diamalt Company,
Riverside, Cincinnati, Ohio.

Castor Oil our own make and Castor Oil Products. Unsurpassed in quality. They are the standards.

BOSSON & LANE,

MANUFACTURERS

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TURKEY RED OIL
SOLUBLE OILS
OLEINE

B. & L. ANTI-CHLORINE (ultra bleaching process)
OLO SOFFENE (superior cotton softener)
CELLULINE—For cotton warps
SIZING AND FINISHING COMPOUNDS

Works and Main Office, ATLANTIC, MASS. (Suburb of Boston.)

FIRTH & FOSTER CO.

Dyers and Finishers

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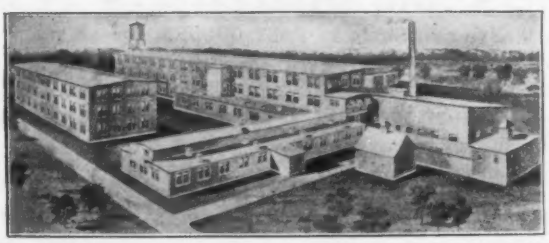

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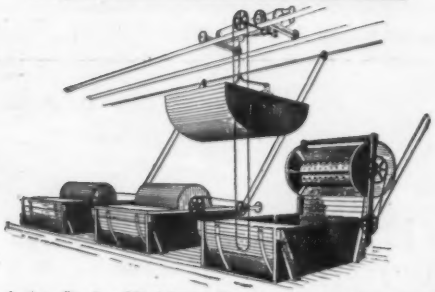

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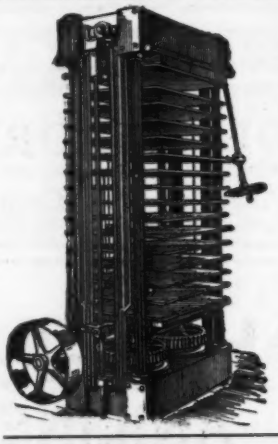

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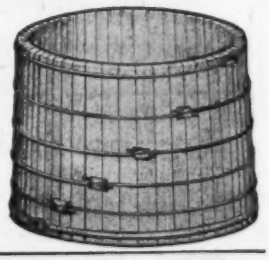

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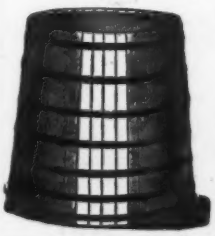

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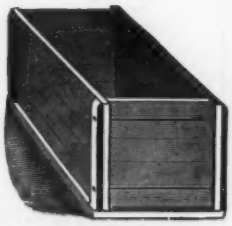

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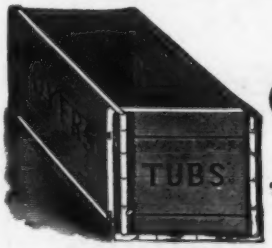

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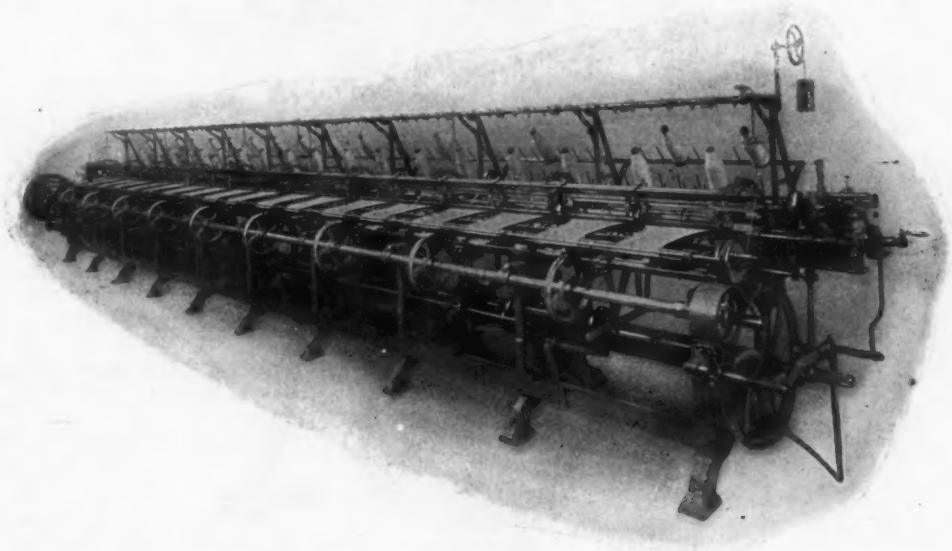

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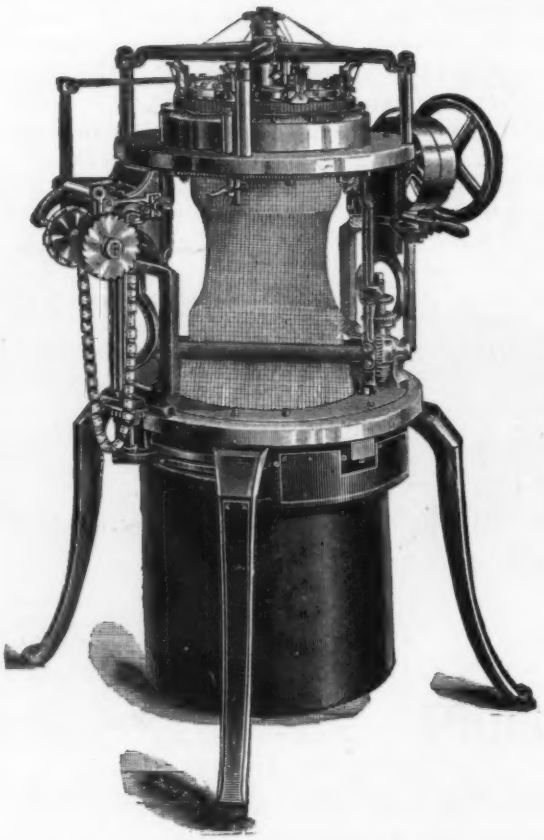

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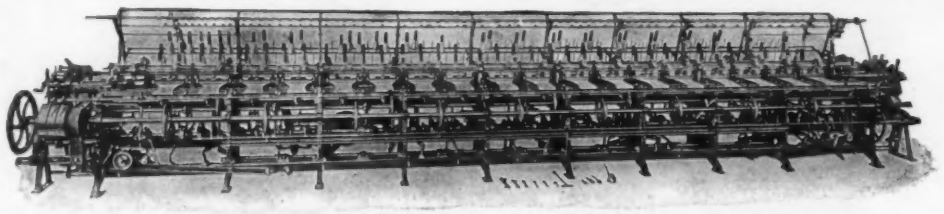

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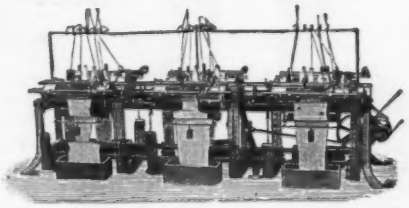

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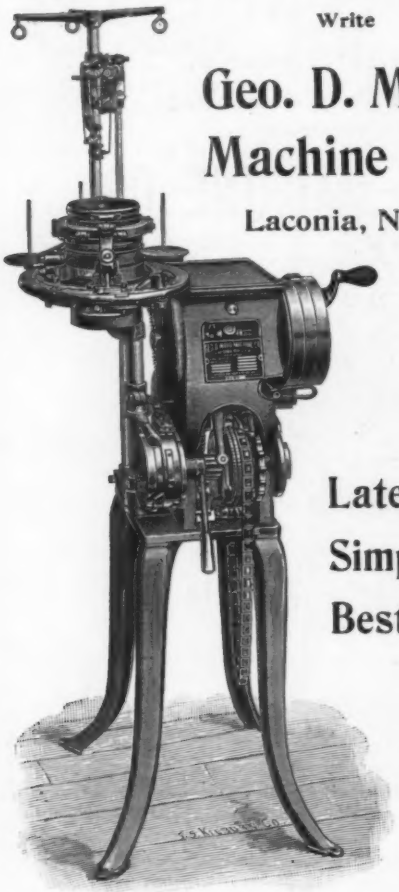

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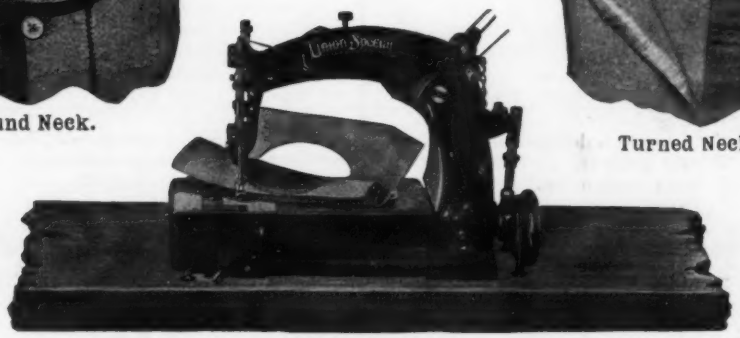

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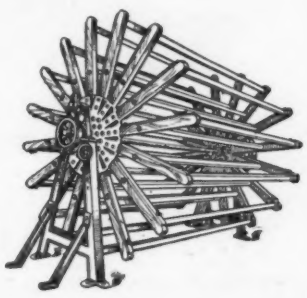

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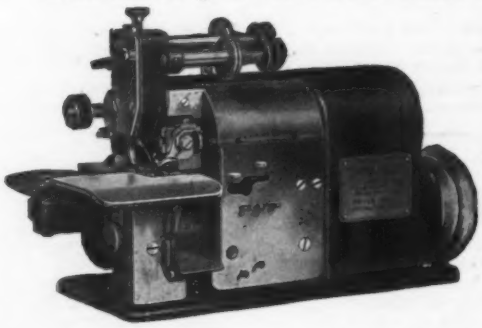
42 Union Spec. Sewing Machines, various styles.
50 Loopers and Seamers, all makes.
60 Ribbed Underwear machines.
300 Hosiery Ribbers and Sleevers.

WRITE FOR COMPLETE LIST. APPRAISEMENTS A SPECIALTY.
We are always in the market to buy good second-hand Knitting and Finishing Machinery.

The Merrow

FAST
DURABLE
Light Running

High Speed Overseaming, Overedging and Scallop Stitch Machines are



OUR NEW STYLE 60 MACHINE for Trimming and Overseaming in one Operation produces the strongest, best Seam and does it with the greatest economy.

USE STYLE 18 for Horse Blankets.
STYLE 17 or 22 for Bed Blankets.
STYLE 35 B SHELL, for Necks and Fronts of Rib Goods, produces the most showy, substantial finish.

Send for Catalogue and Samples.

THE MERROW MACHINE CO. HARTFORD, CONN.

Knickerbocker Building, Sixth and Arch Sts., Phila. Room 321, 467 Broadway, New York

EXCELSIOR KNITTING MACHINE MFG. CO.

Meadow and Washington Streets

ALLENTOWN, PENNA.

BUILDERS OF

Full Automatic Knitters

With or without **Transferring Device**

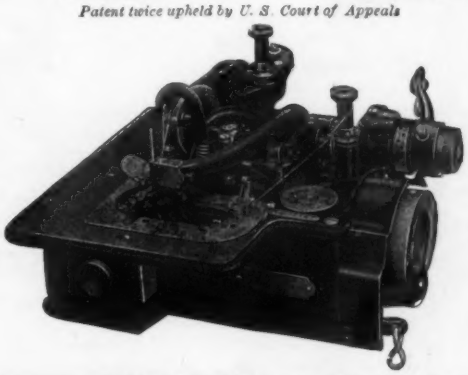
ALL SIZES AND GAUGES, 2 1-4 INCH TO 4 INCH

AN INSTRUMENT OF PRECISION!

"OVERLOCK" MACHINE

(Trade Mark) (Pat. April 5, 1892)

Patent twice upheld by U. S. Court of Appeals



Trade Mark

WILLCOX & GIBBS SEWING MACH. CO. NEW YORK

Business Established in 1850.

For TRIMMING, SEAMING (or Hemming or Overedging) and COVERING Raw Edges of Knit Underwear and Hosiery, in ONE OPERATION at 3000 Perfect Stitches per Minute.

WILLCOX & GIBBS SEWING MACHINE CO.,

General Offices: 658 BROADWAY, cor. BOND STREET,

NEW YORK, N. Y.

LONDON PARIS MILAN DRESDEN BRUSSELS NOTTINGHAM

The Invincible

Full Automatic.

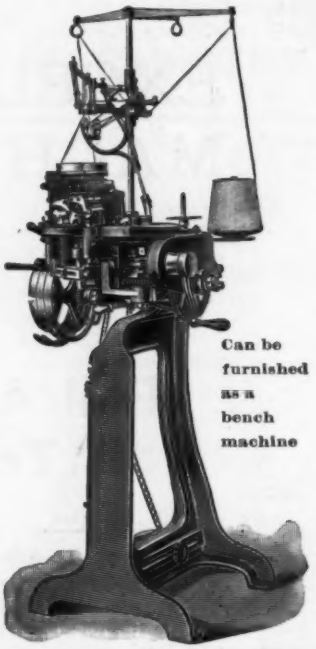
"The KNITTER that KNITS"

THE LARGEST PRODUCER OF PERFECT WORK.
SIMPLE, POSITIVE AND EASY TO OPERATE.

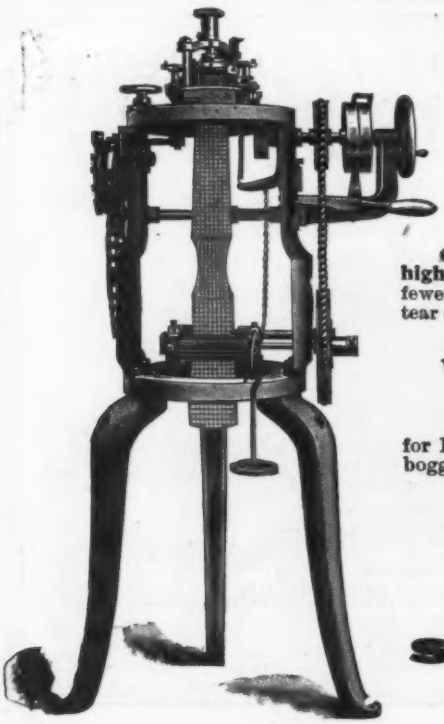
E. JENCKES MFG. CO.

Pawtucket, R. I.

PHILADELPHIA OFFICE,
101 North Sixth St.



Can be furnished as a bench machine



High Speed Rib Knitting Machinery.

Our latest model machinery has been designed to run at very high speed, giving large production. This is accomplished with fewer seconds, less breakage of needles, less jar and wear and tear on machines than has been customary at lower speeds.

We also make Special

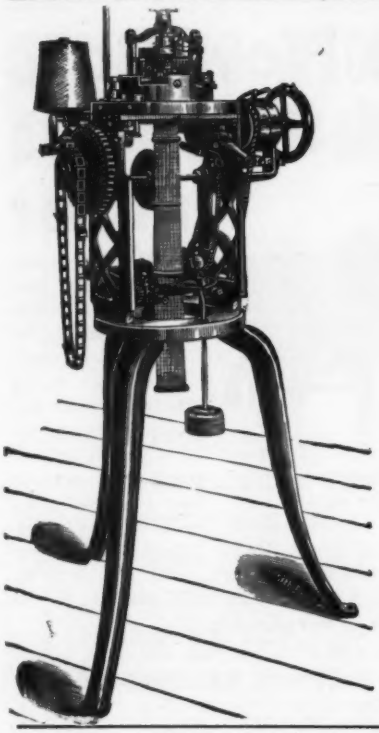
STRIPING AND DESIGNING MACHINES

for Fancy Golf Stockings, Bathing Suits, Sweaters, Toques, Toboggan Caps, Skirts, etc.

Our Machinery gives large production at low cost and enables manufacturers to meet the market always and make a profit.

STAFFORD & HOLT,

LITTLE FALLS, N. Y.



H. Brinton & Co.

213-215 Race Street, Philadelphia, Pa.

BUILDERS OF

Knitting Machinery

For HOSIERY and UNDERWEAR.

Complete Estimates Furnished. Send for Particulars.

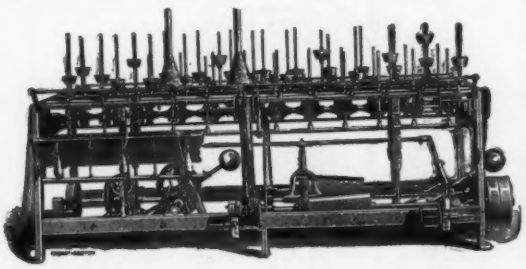
The cut shows our Improved Automatic Ribber with Welt and Slack Course for Half Hose, Tops and Ribbed Legs.

CIRCULAR KNITTING MACHINES

Either plain or full automatic, with stop motions complete. 4 to 24 feeds for

RIBBED UNDERWEAR

Automatic Racking and Striping Machines for Sweaters, Cardigans, Collarettes, Cuffs and Anklets.



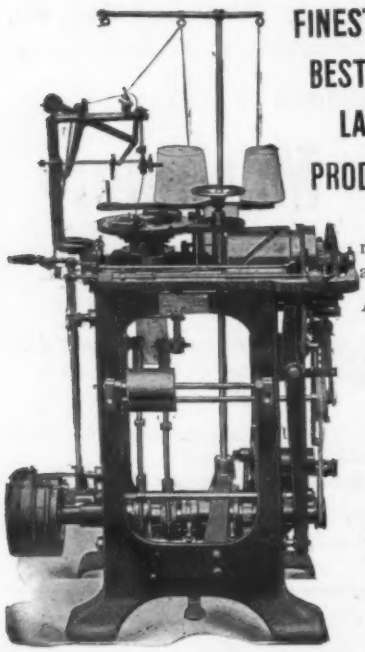
ALSO BUILDERS OF THE WELL-KNOWN

ABEL WINDERS, SEAMERS and LOOPERS.

LEIGHTON MACHINE CO., - Manchester, N. H.

"NATIONAL"

Stands for



FINEST GAUGES
BEST FABRIC
LARGEST
PRODUCT ON

Greatest Variety of Laces and Novelties.

Allautomatic.

Lowest Cost for Operating

Also
Rib Knitting Machinery, Overedge, Crochet and Shell Stitch.

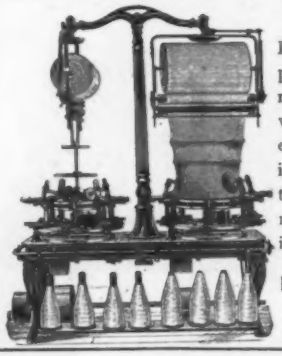
NATIONAL AUTOMATIC KNITTER CO.

728 Cherry Street, PHILADELPHIA, PA.

We are the Oldest Manufacturers

of this Design of Spring Needle Knitting Machine in this Country

40 years' experience



Do not be misled by people who became manufacturers in 1903 without any previous experience who are trying to represent that they are the oldest manufacturers. Investigate.

Robt. W. Gormly & Co.

Troy, N. Y.

The New Boss Seamless Knitter

Do you want the biggest production with the least menders, for the least money? If so, write to the Boss Knitting Machine Works for their circular with full directions. There is no cylinder to be handled. We use only one cylinder and transfer device for half hose or ladies' hose. This machine beats them all. Has no equal for simplicity and durability. Makes 300 revolutions per minute. Built in sizes from 2¼ to 5½; from 40 to 224 needles. Automatic in heel and toe. It is the strongest built knitter on earth.

Send for prices and particulars.

THE BOSS KNITTING MACHINE WORKS,
Cor. Elm and Reed Sts., Reading, Pa.

"Acme" and "Hemphill"

SEAMLESS HOSIERY

Knitting Machines

built by

Mayo Knitting Machine & Needle Company

Franklin, N. H.

Answer all purposes in the *most reliable*, *up-to-date*, and *economical* manner. Write us for full particulars.

Manufacturers like our Latch Needles

because we make a superior grade of needles.

Philadelphia Office, Knickerbocker Bldg.

STANDARD MACHINES FOR HOSIERY MAKING.

The STANDARD F, with attachments, can make any and all of these fabrics:

PLAIN GOODS
PLAITED WORK
THREE COLOR STRIPES
TIPPED HEEL AND TOE
WHITE FOOT
CHANCED HEEL AND TOE
CARTER TOP
LOOPERS SLACK COURSE

Most Stockings--Best Fabrics--Longest Life

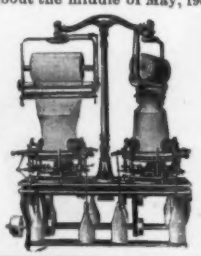
STANDARD MACHINE COMPANY,
OFFICE AND SHOW ROOMS
510 Ludlow St. Philadelphia

We Are the Oldest Manufacturers
IN THE WESTERN HEMISPHERE
Of Circular Spring Needle Loop-Wheel Knitting Machinery.

TOMPKINS BROS. CO., Troy, N.Y.

We submit the following extract from the sworn testimony of R. W. Gormly, in U. S. Circuit Court, Northern District of New York, in equity, No. 6764:

Cross Question 123. How long have you been a manufacturer of knitting machines? Answer. I started in this business about the middle of May, 1900.



Tompkins Knitter

This design was adopted in 1875.

BUSINESS ESTABLISHED in 1846, before ROBERT W. GORMLY Was born, according to his testimony in the case above cited.

"THE BANNER"
Hemphill's Latest

A FULL AUTOMATIC MACHINE

Specially adapted to

Plaited Goods and String Work also High Splice and Double Sole

Largest Production

More Yarn Changes

Highest Speed

Simplest

Least Repairs

Produces a Superior Quality of Work.

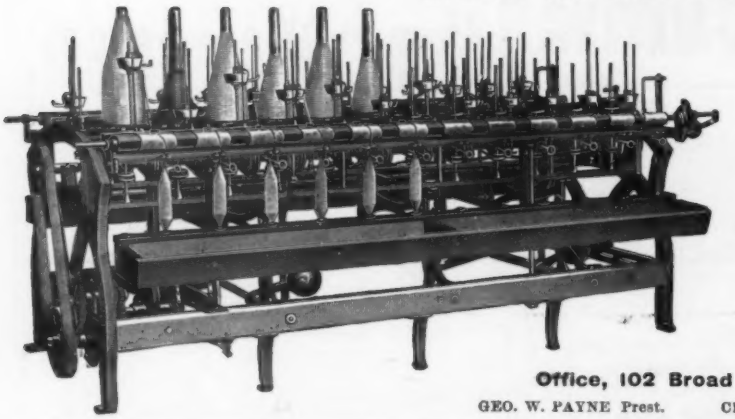
MANUFACTURED BY THE

Hemphill Mfg. Co.

131 Clay Street, PAWTUCKET, R. I.

OVER 1,900 PAYNE WINDERS IN USE

By Hosiery Manufacturers,
Wind for Cop, Skein or Bobbin.



Improved

Upright Spoolers,

To Spool from Cop, Skein or Bobbin.

Doubling Spoolers for doubling 2, 3, or more ends into one.

Upright Quillers, Quill from Cop, Skein or Bobbin.

Ring Dresser, Spooler and Reel Spindles, Cop Skewers, Warp, Spool, Spooler, Guides, Bolsters and Stops Made and Repaired at Short Notice.

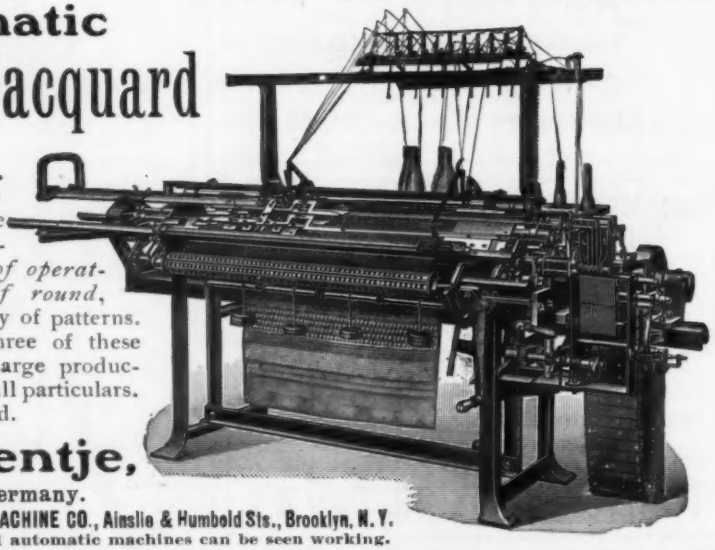
GEO. W. PAYNE CO.,

[Est. 1865. Inc. 1903.]

Office, 102 Broad Street, Pawtucket, R. I.

GEO. W. PAYNE Prest. CLINTON F. PAYNE, Sec'y. and Treas.

Full Automatic
Noppen & Jacquard



for high-grade sweaters, jerseys, etc. Latest improvements

Recognized as the best in the market. With Jacquard attachment allowing *change of operating mechanism every half round*, therefore unrivaled in variety of patterns. One operator attends to three of these machines. High speed. Large production. Ask for samples and full particulars. State gauge and size you need.

Claes & Flentje,

Mühlhausen Thr., Germany.

Representatives, AINSLIE KNITTING MACHINE CO., Ainslie & Humbold Sts., Brooklyn, N. Y.

Where all kinds of our hand and automatic machines can be seen working.

HEPWORTH & CO.'S

Patent Single-Stitch

LOOPING MACHINE.

Needle working from the inside, avoiding the breaking of needles and points and picking up the metal.

Single and Double Stitch, or Both Combined.

JOHN W. HEPWORTH & CO.,

N. W. Cor. Lehigh Ave. and Mascher Street,

PHILADELPHIA.

PAXTON & O'NEILL'S

Full Automatic Knitter

FOR ALL KINDS AND GAUGES OF SEAMLESS HOSIERY.
RANGE ON HALF HOSE AND LADIES FROM 260 NEEDLES DOWN.

3-4 AUTOMATIC KNITTER

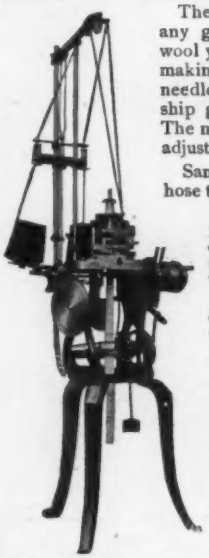
With Lace Effects.

Exclusive rights to BROWN'S LACE ATTACHMENT.

537-39-41 North 3d St., - - - - - PHILADELPHIA.

Use the Ruth

Ribber and Stop Motion



The Ruth Ribber will produce any gauge goods from cotton or wool yarn at a high speed without making bad work or breaking needles. Material and workmanship guaranteed to be first-class. The machine is easy to operate and adjust.

Samples of 240 needle gauze half hose tops furnished by request.

Meet us in Philadelphia at the Exhibition of the National Association of Hosiery Manufacturers of Knit Goods, May 11-16, 1908, or write us now.

Many mills are pleased with our machine and we are sure we can please you.

Give us a trial. Write to-day.

RUTH

Machine Co.

YORK, PA.

G. W. RUTH, Manager

The CRAWFORD

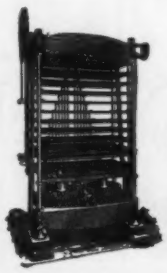


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PLATE PRESS

For Knit or Woolen Goods.

The most reliable machine of the kind on the market.

PRESS PAPERS and FENDERS.

SPENCE & RIDEOUT,

Successors to
J. J CRAWFORD & SON,

NASHUA, N. H.

Established 1868.

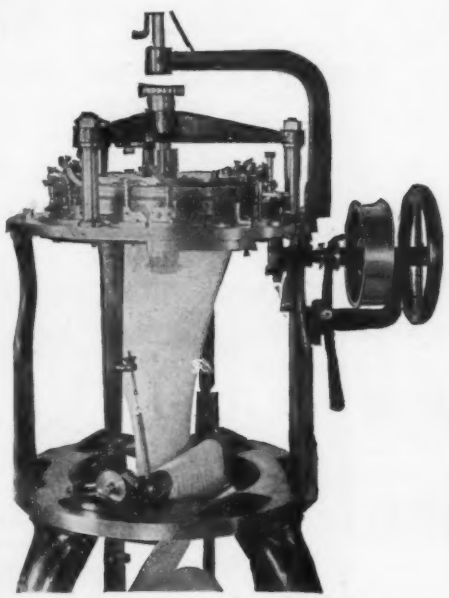
Established 1870.—Incorporated 1890.

CRANE M'F'G. CO.

LAKEPORT, N. H.

Manufacturers of

Spring and Latch Needle Machines for both rib and plain work, producing a great variety of fabrics. Patent removable hardened Wing Burr Wheels.



SPRING NEEDLE RIB MACHINE

Walter The Best and Most Reliable

Flat Knitting Machine

Walter & Co., Ltd., Mühlhausen, Thür, Germany.

Stock OF MACHINES THE MOST IN DEMAND AT
E. W. S. JASPER, New York LIBERTY ST., 120-122

Edouard Dubied & Co.,

Couvet, Switzerland,

Knitting Machines,

Hand and Power.

HIGH CLASS WORK ONLY.

Paris 1900 "Grand Prix"
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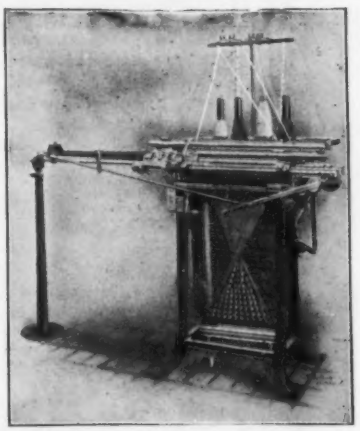
For catalogues and particulars apply direct to Couvet Works.



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BOARDS FOR FAST BLACK DYERS.

HOSIERY FINISHING BOARDS.

BEST WORK. PROMPT SERVICE. PRICES ALWAYS RIGHT.

JOS T. PEARSON 1815-21 TAYLOR ST. KENSINGTON PHILA

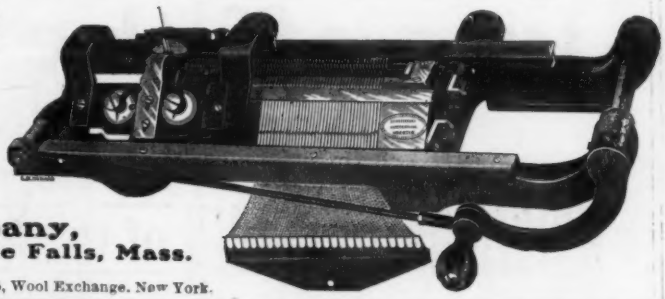
Hosiery Boards.

The LAMB

LEADER OF KNITTERS

Original and Still the Best.

Most widely used; being operated in every civilized country in the world. For description, prices, etc., see catalogue.



Circular Machines, Rib Top and Seaming Machines.

Lamb Knitting Machine Company,

P. O. Box, 5888, **Chicopee Falls, Mass.**

J. E. WOODHEAD, 100 22d St., Chicago.
L. D. SANBORN, Room 585, Wool Exchange, New York.

Patent Loopers

Both single and double Stitch.

with the Patent Raised or Straight Points.

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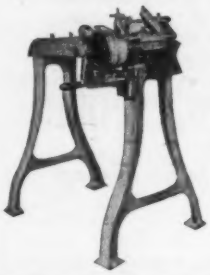
Robinhold Machine Co.

Patentees and Manufacturers of the only



Practical Automatic

Power Top Cutting Machine

Will cut anything with a Welt

650 N 8th Street
Reading, Pa.

SAVOGRAN

Cleans Wool, Floors, Anything.

INDIA ALKALI WORKS, Boston.

CHARLES COOPER,

BENNINGTON, VERMONT,

MANUFACTURER OF

Knitting Machinery

Flat and Circular Rib, both Spring and Latch Needle, Plain Circular Machines, Lead or Trick Cylinder, **Spring Needle Cylinder Rib-Top Machines** for making Cuffs, Drawer Bottoms and Shirt Borders. **Spring and Latch Knitting Needles, Burr Wheels, Burr Blades, Sinkers, Jacks, etc.**

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509 Clinton Street, Hudson, N. Y.

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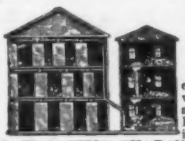
FELIX LEDEKER,
1x/4 Schubertgasse, Nr. 22, Vienna, Austria.



CHARLES H. SCHNITZLER,

Patentee and Sole Manufacturer of

THE PNEUMATIC CONVEYOR

For the handling of wool and cotton stock, rags, excelsior, jute and all kinds of fibrous material, wet or dry. Also spool elevators, steam heating and ventilating, and mill work generally. Blower and fan work a specialty. This conveyor is patented. Beware of infringement.

SATISFACTION GUARANTEED Patented Oct. 15, 1889.

215 NORTH SECOND ST., - PHILADELPHIA, PA

WILLIAM C. BULL,

BENNINGTON, VERMONT.

MAKER OF

Drying Form Boards

OF EVERY VARIETY.

For Ladies', Gents' and Children's Goods.

Latest Styles.

Best Workmanship.

Just off the press

1908 Edition

American Directory of the Knitting Trade

26th year—**The red covered book**—26th year

Over 100 new mills and thousands of changes since 1907. As there is only a limited edition it is well to order now.

Handy size for the Pocket About 500 pages Price, $1.00

What it contains

Full reports of every knitting mill in the United States and Canada, giving capitalization; names of the officers, including superintendent and buyer; kind of goods made; number of knitting machines, whether latch or spring needle; number of sewing machines; whether the mill dyes or bleaches or finishes; kind of power; number employed; selling agent; kind of yarn bought.

Special copyrighted maps of the mill districts, showing the cities and towns where there are knitting mills. It is so indexed that any town may be quickly found. This section of the directory is arranged alphabetically by states and towns.

Carefully classified index of manufacturers according to kind of goods made, all the manufacturers of various kinds of goods being grouped together.

Alphabetical index of manufacturers, giving the page number where full report of mills is to be had.

List of dyers, bleachers, finishers, printers, etc., making a specialty of knit goods work.

Manufacturers' selling agents and commission merchants handling knit goods; the name of the person in charge of the knit goods department is given, and when a concern is sole agent or special selling agent for certain mills the names of the mill sold for follow the agent's names.

List of the jobbers of knit goods, telling the kind of goods handled and the name of the buyer, with the New York address.

Department stores and large retailers handling knit goods, with the names of the knit goods buyers and the address of the New York office.

An index of machinery and supplies used in the manufacture of knit goods, also yarn dealers supplying knitting yarns.

Published by the

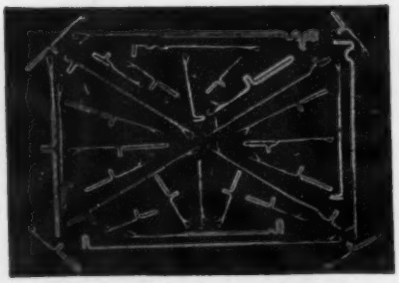
LORD & NAGLE COMPANY

Textile Publishers, 144 Congress St., Boston

New York **Philadelphia** **Chicago**

TRY OUR "SUPERIOR" OR SUNKEN RIVET-HEAD NEEDLES

They will save you money.



Dodge Needle Co., Manchester, N. H.

WM. COREY CO.,

Manufacturers of Knitting Machine

Latch Needles

MANCHESTER, N. H.

EXCELSIOR NEEDLES.

The best Hosiery Needles in the market.

Manufactured by

WARDWELL NEEDLE CO., Lakeport, N. H.

WM. BREEDON'S SON,

MANUFACTURERS OF

Spring Knitting Needles

AND BURR BLADES OF ALL KINDS.

AMSTERDAM, - N. Y.

LEWIS JONES,

60½ and Media Streets, . . . PHILADELPHIA.

GAS ENGINES for city or country
BRUSHING MACHINERY } EFFICIENT DURABLE
KNITTING MACHINERY } LOW IN PRICE

Standard Latch Needles

MANUFACTURED BY

EXCELSIOR NEEDLE CO.,

TORRINGTON, CONN.

The Largest Manufacturers of Machine Needles in the World.

STANDARD TRADE MARK.

Longer Wear. Better Work.
Less Mending. Fewer Seconds.
Have you tried our
Patent Milled Rivet?

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J. C. Strittmatter, 2a Calle de San Francisco No. 9, City of Mexico, Mexico.

L. T. IVES CO.

Manufacturers of all kinds of

SPRING KNITTING NEEDLES

NEW BRUNSWICK, N. J.

PAGE NEEDLE CO.,

MANUFACTURERS OF

LATCH NEEDLES

of all kinds. Warranted in every respect.

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Agents: J. E. Woodhead, 100 Twenty-second Street, Chicago, Ill. Durbrow & Hearne Mfg. Co., 12 Wooster Street, New York. James Taylor, 121 Arch Street, Philadelphia, Pa.

KEYSTONE LATCH NEEDLE CO.

JOHN C. EGLY, MGR.

MANUFACTURERS OF

Patent and Regular Latch Needles

Needles for all makes of Knitters and Ribbers.
Keystone Spring Bottom Needles for all makes of Knitting Machines always in stock for immediate delivery.
Special Needles made to order.

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The Continental Latch Needle Company.

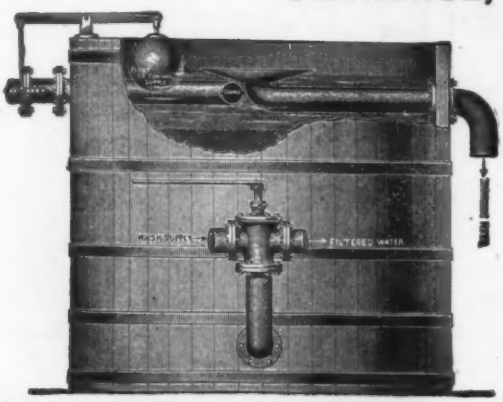
Manufacturers of the BEST GERMAN NEEDLE on the Market.

RIVETS GUARANTEED. Samples on application. SPRING NEEDLES A SPECIALTY.

120-122 LIBERTY STREET, - - - - - - - - - NEW YORK.

NORWOOD ENGINEERING COMPANY,

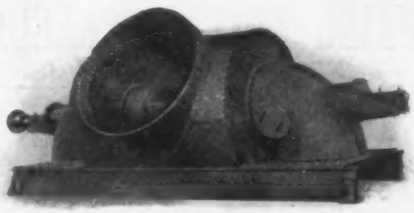
FLORENCE, MASS.



WILSON FILTERS FIRE HYDRANTS

Our filters are already in use in a number of the representative textile mills of the country, from whom we have received many expressions of satisfaction. Our representative will call and explain our system whenever desired.

McCormick Turbines



both Cylinder and Wicket Gate, giving **ENORMOUS** power are used in hundreds of textile mills throughout the world.

We make a specialty of designing turbines to meet the requirements of the public.

We build Francis turbines in spiral flumes to operate under high heads.

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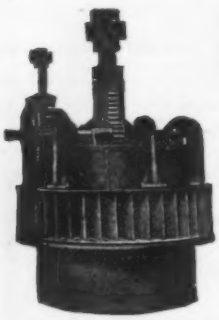

Risdon-Alcott Turbine Co.

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RISDON CELEBRATED TURBINE
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On Horizontal or Vertical Shafts.

These Turbines are recognized as the most effective water wheels made. Your inquiries should come direct to us for this class of machinery.

Ventilation

is a very important matter in textile mills when viewed from a humanitarian or profit point of view. The "A B C" way costs the least and gives perfect satisfaction.

"A B C"

Disc Fans

Production

can be kept up during the hot weather. "A B C" Ventilating Fans improve the working conditions by keeping cool, pure air in constant circulation. Write for particulars.

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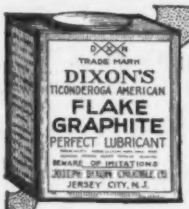

In cylinders, bearings, gears and all friction points Dixon's Flake Graphite saves wear and power.

Successful engineers use it. Write for free booklet and sample—write to-day.

Joseph Dixon Crucible Co.
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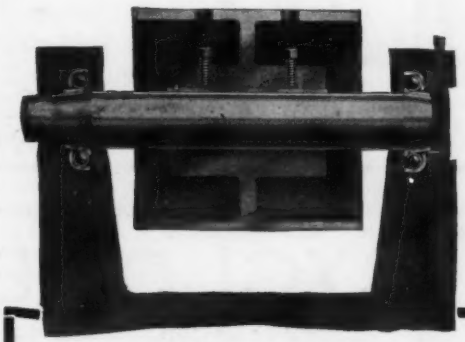

Frictionless Bearings

are the surpassing feature of **Massachusetts Ball Bearing Exhausters.** Journal friction is reduced 85 per cent. Each bearing is packed with vaseline when shipped ; only a semi-annual repacking is neccessary. All bearings are run under a test pressure of eight tons so that no defective part may escape notice.

Massachusetts Fan Company
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You Save Enough Insurance to Pay for the Equipment.

So it costs you NOTHING to have the AMERICAN WATCHMAN'S CLOCK. Fully approved by all insurance companies. We equip factories with Fire Alarms, Signals, etc., also Employee's Time Recorders, and Telephone Systems. Electric Time System consists of Master Regulator in office with secondary electric clocks throughout the mill, insuring accurate time. Send for particulars.

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Detroit Lubricators
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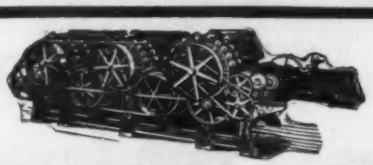

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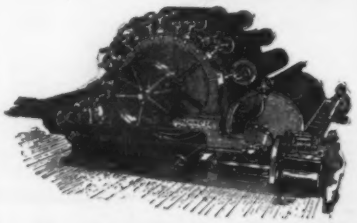
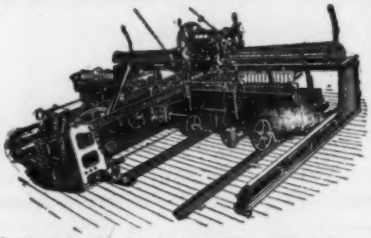
For reducing to Fibre Cotton and Wool Waste, Cloth Clippings, Etc.



WOOLEN MILL MACHINERY



Including Rag, Wool and Burr Pickers, Wool, Worsted and Shoddy Cards, Mules, Yarn Twisters, Warpers, Dressers, Spoolers, Etc.

Complete Equipment for Manufacturing Cotton Batting for All Purposes.

Special Carding and Spinning Machinery for manufacturing Yarn from such low grade stock as Mill Sweepings, Linters, Etc.

We reclothe or furnish new Metallic Toothed Cylinders and Rolls and relagg or furnish new Cylinders for any make of Rag Picker.

SMITH & FURBUSH MACHINE CO., Hancock and Somerset Streets, **PHILADELPHIA, PA., U. S. A.**

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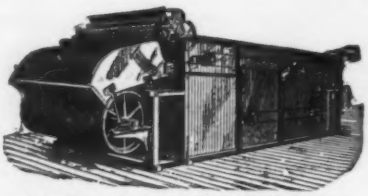
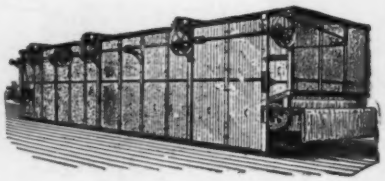
For Cotton Stock, Wool Stock, Rags, Yarn, Cloth Underwear, Stockings, etc.



Automatic Cotton or Wool Stock Dryer.



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Complete Carbonizing Outfits for Wool, Rags or Cloth.

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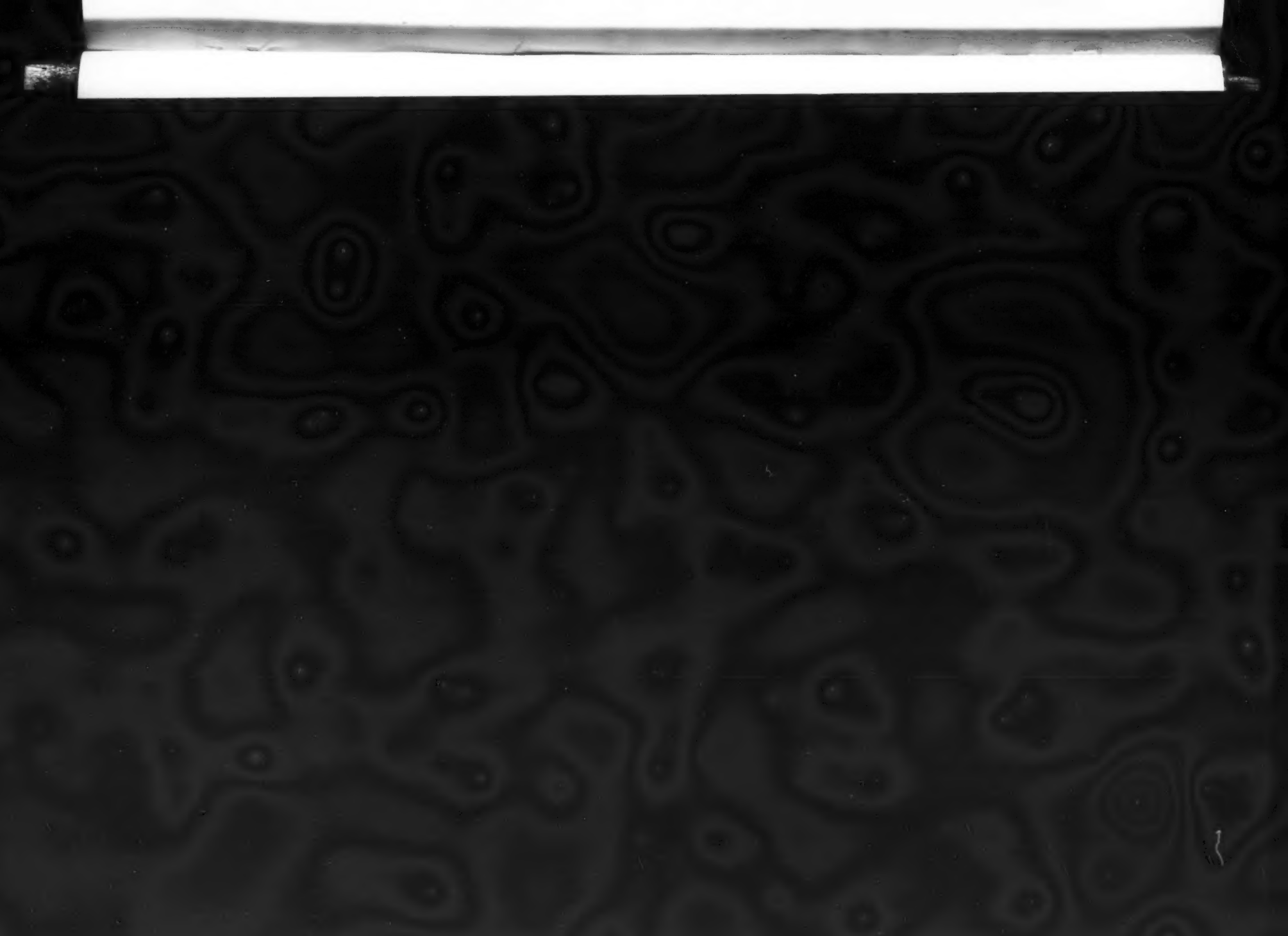

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MANUFACTURED BY THE RHODE ISLAND FIBER SPOOL CO.,
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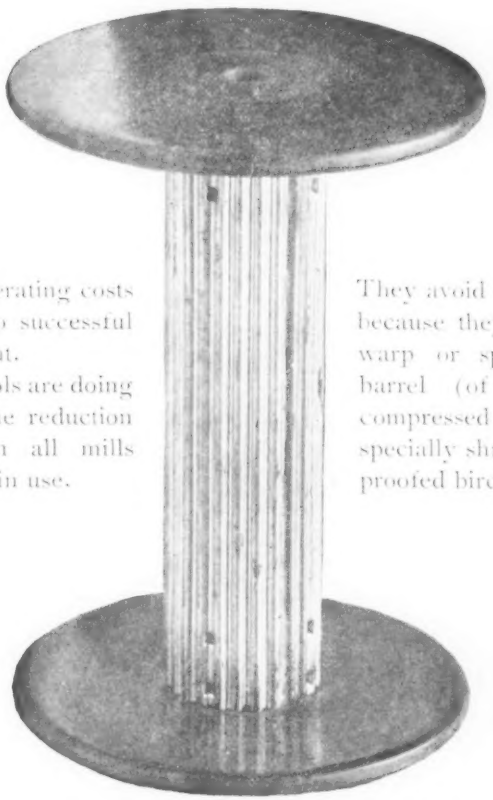

Economy in operating costs is an essential to successful mill management.
These fiber spools are doing their part in the reduction of expenses in all mills where they are in use.

They avoid waste and delay because they do not break, warp or splinter. Metal barrel (of tinned steel), compressed fiber heads, specially shrunk and waterproofed birch bushings.

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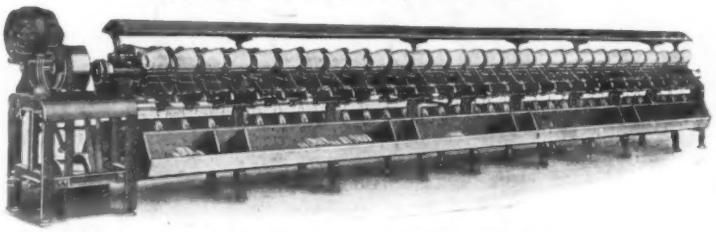

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